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ABSTRACT

This is the teacher's manual to accompany part 2 of the workbook for grade 4 pupils in the Comprehensive Instructional Management System, a teacher-designed unified mathematics curriculum for kindergarten through grade 7. It is composed of a curriculum, a testing component, and a computer-managed reporting system. The curriculum is organized into modules of similar skills or understandings from 14 topics. Each module has: a suggested period of duration for student mastery; a listing of new skills to be mastered by the student in the form of performance objectives; a section devoted to vocabulary, terms, and symbols; getting-started activities on prerequisite skills in preparation for undertaking new objectives; strategies for teaching the new skills; and student activities for providing reinforcement for the newly learned objective. After the sequence of modules and content by topic are displayed, teaching suggestions for 70 modules on over 120 performance objectives are given. The content is from the topics of: numbers and numeration; addition; subtraction; multiplication; division; fractions; decimals; integers; geometry; measurement; algebraic concepts; graphs, probability, statistics; and problem solving, plus review. Pages from the student's workbook are interspersed with the suggested activities. (MNS)

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CIMS

COMPREHENSIVE INSTRUCTIONAL MANAGEMENT SYSTEM

A Cyclical Mathematics Curriculum

PART 2—TEACHER

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FOREWORD

The Comprehensive Instructional Management System (CIMS) is a unified mathematics curriculum for grades K-7. The curriculum is cyclical in design, and reflects the most recent New York City and New York State guidelines.

Utilizing the experience of our system's teachers, we have developed a teacher-designed curriculum that includes a rich selection of classroom-tested successful mathematics activities. The major goal of the CIMS mathematics project is to provide the classroom teacher with a well-structured, objective-based curriculum. All objectives are supported by a variety of strategies. Student mastery of these objectives is readily diagnosed through the system's testing component.

The curriculum format is structured to allow the teacher to determine the ability level of the students in the topic under study, and to permit the students to move forward at their individual rates. Each module of instruction provides the teacher with a set of related performance objectives. These objectives are supported by activities which probe and develop the students' readiness to undertake new skills and concepts. Further reinforcement is given to mastery of the objectives through accompanying student workbooks.

It is hoped that this curriculum will not only assist teachers in developing vital mathematics instruction, but will serve to expand and enrich students' mathematics skills.

Charlotte Frank

Charlotte Frank,
Executive Director
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ACKNOWLEDGMENTS

The Comprehensive Instructional Management System (CIMS) was developed as a project of the Division of Curriculum and Instruction, Charlotte Frank, Executive Director. Dr. Peter Negroni, Community School Superintendent CSD 12; Dr. Harvey Garner, Community School Superintendent CSD 18; Carlos Edwards, Community School Superintendent CSD 23, and Joseph Pacheco, Community School Superintendent CSD 32 supervised the overall development of the CIMS program within their respective districts.

Morris Freedman, Director of the Office of Curriculum Development and Support; Irwin Kaufman, Director of Mathematics; Kenneth Bates, Director of CIMS; Maria DeSalvio, Assistant Director of Mathematics; Arthur Flug and Doreen Genkin, Assistant Directors of CIMS and Gene Menchini, Program Manager, Distributive Systems, Office of Data Processing Coordination provided overall supervision of this project.

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TABLE OF CONTENTS

LEVEL 4

Introduction.. xi

Topic Tab Key... xiii

Instructional Sequence Description............................ xiv

Instructional Sequence.. xv

Content by Topic... xix

Table of Symbols.. xxiii

Metric Table.. xxiv

Equipment Checklist.. xxv

INTRODUCTION

The Comprehensive Instructional Management System (CIMS) is a teacher-designed educational delivery system composed of a curriculum, a testing component and a computer managed reporting system.

Designed to support mathematics instruction in the classroom, CIMS provides a comprehensive cyclical mathematics curriculum for grades K through 7. Each manual describes the curriculum for a single level or grade. Teacher curriculum developers from elementary, intermediate and senior high schools utilized the most current New York City and New York State guidelines in formulating the curriculum's modules and sequence.

Curriculum Topics

The CIMS mathematics curriculum has been organized into the following 14 topics:

.01	Numbers and Numeration
.02	Addition of Whole Numbers
.03	Subtraction of Whole Numbers
.04	Multiplication of Whole Numbers
.05	Division of Whole numbers
.06	Fractions
.07	Decimals
.08	Integers
.09	Geometry
.10	Measurement
.11	Algebraic Concepts
.12	Graphs, Probability, Statistics
.13	Problem Solving
.14	Review

Modules of Instruction

The CIMS curriculum is organized into modules or groupings of similar skills or understandings. Each module has a suggested period of duration for student mastery, a listing of new skills to be mastered by the student in the form of performance objectives, a section devoted to vocabulary, terms and symbols, getting started activities which serve as prerequisite skills in preparation for undertaking new objectives, strategies for teaching the new skills and student activities for providing reinforcement for the newly learned objective. Note that the lesson duration is included only as a guideline to the teacher for planning purposes. The actual time required for each module will vary from class to class and from child to child depending on the needs of the students and the teacher's judgment.

Priorities of Performance Objectives

There is an order of priority to be recognized in teaching the content presented in the CIMS NEW YORK CITY MATHEMATICS CURRICULUM. Performance objectives with the greatest priority are so basic that unless the student acquires a satisfactory degree of competency in them, the student cannot progress. Such topics are marked A and mastery by all pupils is essential.

Performance objectives marked B are required to be presented to all students. Mastery is not expected at this time. These objectives will be developed further and reinforced later.

Performance objectives marked C are of special interest. These should be taught to increase positive attitudes towards mathematics.

Summary: A - Mastery of this objective is essential for progress. Opportunities for reinforcement should be provided throughout the school year.

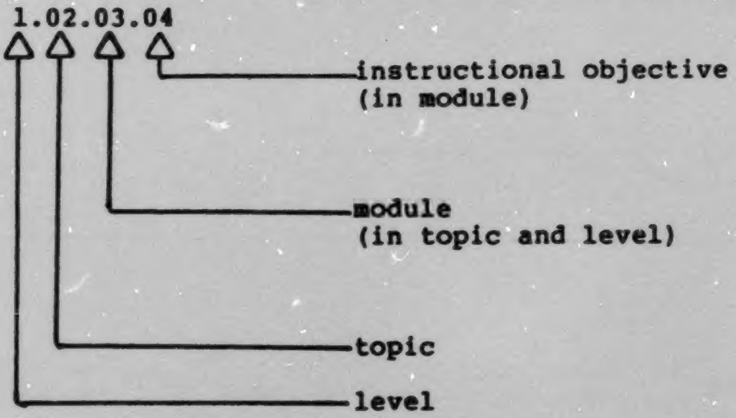
B - These objectives are to be taught to all pupils. Mastery is not essential at this time because the topics will be further developed and reinforced.

C - Objectives of special interest.

Topic Tab Key

01. Numbers and Numeration
02. Addition of Whole Numbers
03. Subtraction of Whole Numbers
04. Multiplication of Whole Numbers
05. Division of Whole Numbers
06. Fractions
07. Decimals
08. Integers
09. Geometry
10. Measurement
11. Algebraic Concepts
12. Graphs, Probability, Statistics
13. Problem Solving
14. Review

Module Coding Key


1.02.03.04
instructional objective
(in module)
module
(in topic and level)
topic
level

INSTRUCTIONAL SEQUENCE DESCRIPTION

An instructional sequence is given in list form on the following pages for this level. The sequence has been arranged to reflect what is considered the most effective presentation of the mathematics curriculum. Each module in the list is described by its unit number, module number, title, and page location.

The CIMS tests are integrated within the manual sequence. The test number is located in the first column. Each test is designed to assess priority objectives from the preceding modules. The tests are used to determine student mastery of specific performance objectives within these modules and appear in a multiple choice format. Each performance objective code number preceded by an * indicates that the performance objective is not tested on a CIMS test.

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INSTRUCTIONAL SEQUENCE - LEVEL 4

TEST NUMBER	UNIT NUMBER	MODULE NUMBER	TITLE	PAGE NUMBER
	1	4.14.01	Review basic facts	1
	2	4.13.01	Problem solving - guess and check	2
	3	4.09.01	Space figures and their properties	4
	4	4.12.01	Graphs	5
	5	4.14.02	Place value	7
4.01	6	4.01.01	Place value of 5- and 6-digit numbers	8
	7	4.01.02	Round 4- and 5-digit numbers	9
	8	4.13.02	Problem solving: use graphs to locate information	10
	9	4.14.03	Review - addition	12
4.02	10	4.02.01	Addition of numbers through 4-digits	13
	11	4.14.04	Review - subtraction	15
	12	4.03.01	Subtraction of 5-digit numbers with and without regrouping	16
	13	4.13.03	Problem solving - use number sentences to solve problems	18
	14	4.14.05	Review - multiplication	20
	15	4.04.01	Basic multiplication facts for 11 and 12 through 144	21
	16	4.14.06	Review - division	22
4.03	17	4.05.01	Properties of division	23
	18	4.05.02	Division of a 2- and 3-digit dividend by a 1-digit divisor without regrouping	25
	19	4.05.03	Division of a 2- and 3-digit dividend by a 1-digit divisor with regrouping	27
	20	4.10.01	Money to fifty-dollar bill	29
	21	4.06.01	Equivalent fractions	30
4.04	22	4.06.02	Order of unit fractions	32
	23	4.06.03	Separate whole objects	33

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INSTRUCTIONAL SEQUENCE - LEVEL 4

TEST NUMBER	UNIT NUMBER	MODULE NUMBER	TITLE	PAGE NUMBER
	24	4.10.02	Linear measurement	34
	25	4.01.03	Even and odd patterns with addition and subtraction	35
	26	4.09.02	Lines and properties of lines	37
	27	4.07.01	Decimals - hundredths	38
4.05	28	4.12.02	Probability	39
	29	4.07.02	Order decimals	40
	30	4.01.04	Prime numbers	41
	31	4.09.03	Properties of a circle	42
	32	4.09.04	Triangles	43
	33	4.06.04	Improper fractions	44
	34	4.10.03	Customary capacity relationships	45
4.06	35	4.06.05	Addition and subtraction of fractions with common denominators	46
	36	4.09.05	Diagonals of a polygon	47
	37	4.09.06	Parallelograms	48
	38	4.10.04	Perimeters	49
	39	4.05.04	Division of money values	51
	40	4.01.06	Roman system to symbol C	52
	41	4.10.05	Circumference	53
	42	4.11.01	Open sentences - terms	54
	43	4.02.02	Associative property in addition	55
4.07	44	4.02.03	Addition of 5-digit numbers	56
	45	4.03.02	Subtraction of 5-digit numbers	57
	46	4.04.02	Properties of multiplication	58
	47	4.04.03	Multiplication by a 1-digit number	59

REVISED
INSTRUCTIONAL SEQUENCE - LEVEL 4

TEST NUMBER	UNIT NUMBER	MODULE NUMBER	TITLE	PAGE NUMBER
	48	4.05.05	Division of 4-digit dividends by 1-digit divisors	60
	49	4.10.06	Measurement - temperature	61
4.08	50	4.08.01	Integers	62
	51	4.12.03	Arrangements	63
	52	4.13.04	Problem solving - patterns	64
	53	4.06.06	Common factors	65
	54	4.10.07	Area	66
	55	4.10.08	Volume	67
	56	4.07.03	Addition of decimals	68
4.09	57	4.07.04	Subtraction of decimals	69
	58	4.07.05	Multiplication of decimals to tenths	70
	59	4.01.06	Patterns in numeration	71
	60	4.01.07	Place value through hundred millions	72
	61	4.06.07	Addition of fractions with unlike denominators	73
	62	4.06.08	Subtraction of fractions with unlike denominators	74
4.10	63	4.12.04	Statistics	75
	64	4.04.04	Multiplication of 2-digit numbers	76
	65	4.04.05	Multiplication of a 3-digit number by a 2-digit number	77
	66	4.09.07	Symmetry	78
	67	4.09.08	Coordinate geometry	79
	68	4.05.06	Division of 2-, 3- and 4-digit dividends by 10 and multiples of 10 as divisors	80
	69	4.05.07	Division of 2-, 3- and 4-digit dividends by 2-digit divisors	81
4.11	70	4.09.09	Geometric designs	82

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CONTENT BY TOPIC

LEVEL 4

Topic 01: Numbers and Numeration

4.01.01 Place value of 5- and 6-digit numbers... 8
4.01.02 Round 4- and 5-digit numbers........... 9
4.01.03 Even and odd patterns with addition and subtraction.................... 35
4.01.04 Prime numbers.......................... 41
4.01.05 Roman system to symbol C............... 52
4.01.06 Patterns in numeration................. 71
4.01.07 Place value through hundred millions.... 72

Topic 02: Addition of Whole Numbers

4.02.01 Addition of numbers through 4-digits.... 13
4.02.02 Associative property in addition........ 55
4.02.03 Addition of 5-digit numbers............ 56

Topic 03: Subtraction of Whole Numbers

4.03.01 Subtraction of 5-digit numbers with and without regrouping................ 16
4.03.02 Subtraction of 5-digit numbers.......... 57

Topic 04: Multiplication of Whole Numbers

4.04.01 Basic multiplication facts for 11 and and 12 through 144.................... 21
4.04.02 Properties of multiplication........... 58
4.04.03 Multiplication by a 1-digit number...... 59
4.04.04 Multiplication of 2-digit numbers....... 76
4.04.05 Multiplication of a 3-digit number by a 2-digit number..................... 77

Topic 05: Division of Whole Numbers

4.05.01 Properties of division................. 23
4.05.02 Division of a 2- and 3-digit dividend by a 1-digit divisor without regrouping........................... 25
4.05.03 Division of a 2- and 3-digit dividend by a 1-digit divisor with regrouping.. 27
4.05.04 Division of money values................ 51
4.05.05 Division of 4-digit dividends by 1-digit divisors..................... 60

REVISED

CONTENT BY TOPIC

LEVEL 4

4.05.06 Division of 2-, 3- and 4-digit dividends by 10 and multiples of 10 as divisors.......................... 80

4.05.07 Division of 2-, 3- and 4-digit dividends by 2-digit divisors......... 81

Topic 06: Fractions

4.06.01 Equivalent fractions..................... 30

4.06.02 Order of unit fractions................. 32

4.06.03 Separate whole objects.................. 33

4.06.04 Improper fractions...................... 44

4.06.05 Addition and subtraction of fractions with common denominators.............. 46

4.06.06 Common factors.......................... 65

4.06.07 Addition of fractions with unlike denominators.......................... 73

4.06.08 Subtraction of fractions with unlike denominators.......................... 74

Topic 07: Decimals

4.07.01 Decimals - hundredths................... 38

4.07.02 Order decimals.......................... 40

4.07.03 Addition of decimals.................... 68

4.07.04 Subtraction of decimals................. 69

4.07.05 Multiplication of decimals to tenths.... 70

Topic 08: Integers

4.08.01 Integers................................ 62

Topic 09: Geometry

4.09.01 Space figures and their properties...... 4

4.09.02 Lines and properties of lines........... 37

4.09.03 Properties of a circle.................. 42

4.09.04 Triangles............................... 43

4.09.05 Diagonals of a polygon.................. 47

4.09.06 Parallelograms.......................... 48

4.09.07 Symmetry................................ 78

4.09.08 Coordinate geometry..................... 79

4.09.09 Geometric designs....................... 82

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CONTENT BY TOPIC

LEVEL 4

Topic 10: Measurement

4.10.01 Money to fifty-dollar bill.............. 29
4.10.02 Linear measurement...................... 34
4.10.03 Customary capacity relationships........ 45
4.10.04 Perimeters.............................. 49
4.10.05 Circumference........................... 53
4.10.06 Measurement - temperature............... 61
4.10.07 Area.................................... 66
4.10.08 Volume.................................. 67

Topic 11: Algebraic Concepts

4.11.01 Open sentences - terms.................. 54

Topic 12: Graphs, Probability, Statistics

4.12.01 Graphs.................................. 5
4.12.02 Probability............................. 39
4.12.03 Arrangements............................ 63
4.12.04 Statistics.............................. 75

Topic 13: Problem Solving

4.13.01 Problem solving - guess and check....... 2
4.13.02 Problem solving: use graphs to locate information............................ 10
4.13.03 Problem solving - use number sentences to solve problems..................... 18
4.13.05 Problem solving - patterns.............. 64

Topic 14: Review

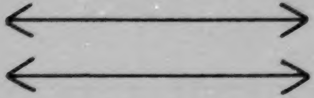
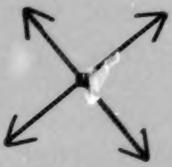
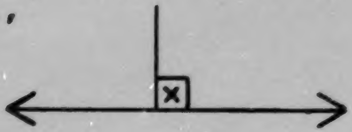
4.14.01 Review basic facts...................... 1
4.14.02 Place value............................. 7
4.14.03 Review - addition....................... 12
4.14.04 Review - subtraction.................... 15
4.14.05 Review - multiplication................. 20
4.14.06 Review - division....................... 22

Unit 26

4.09.02 LINES AND PROPERTIES OF LINES

(1-2 lessons)

PERFORMANCE OBJECTIVES

	The student will be able to...
4.09.02.01B	identify parallel lines as two lines that do not intersect; e.g., 
4.09.02.02B	identify intersecting lines as two lines having a point in common; e.g., 
4.09.02.03B	identify perpendicular lines as lines that form right angles. e.g., 

4.09.02

VOCABULARY

TERMS

parallel
intersect
point
perpendicular
right angle

GETTING STARTED

Prepare and distribute geoboards and rubberbands to each student. Ask the students to make various shapes on their geoboard, e.g., square, rectangle, triangle.

Prepare a set of space figures and representative objects, e.g., cylinder and can, cube and block, and a large bag.

Place a space figure in the bag, e.g., cylinder. Ask a student to put his/her hand in the bag and try to identify the object. Ask another student to identify the familiar object that has that shape, e.g., a can.

Continue this procedure using other figures.

4.09.02

4.09.02.01 **identify parallel lines as two lines that do not intersect**

STRATEGY 1: Prepare and distribute rulers. Ask the students to take out their notebooks. Say, "Look at the blue lines on the paper. Do you think they will ever meet? Do you think these lines will ever cross each other? What do you notice about the distance between the lines?" Ask the students to measure the distance between any two lines to see that they are the same distance apart at all points. Say, "These lines are called parallel lines. Parallel lines will never meet." Ask the students to find examples of parallel lines in the classroom.

STRATEGY 2: Prepare and distribute dot paper to each student. Say, "Draw a line through each of the two top rows of dots. Do you think these lines will ever meet?...ever cross? These lines are called parallel lines. They will never meet and never cross."

Ask the students to draw parallel lines on the diagonal and vertical.

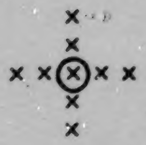
4.09.02.02 **identify intersecting lines as two lines having a point in common**

STRATEGY 1: Prepare and distribute two different colored crayons. Say, "Jerry and his father are planting two rows of flowers. Using a red crayon draw a row of dots. They would like to plant the 2nd row so that the flowers 'cross over' the first row. Use the blue crayon to show a row of flowers crossing over the first row."

4.09.02

STRATEGY 1: cont'd

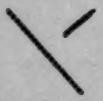
e.g.,



Say, "Circle the point at which both rows have the same color. When two lines cross at a point, they are called intersecting lines."

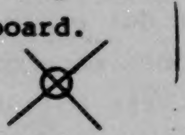
STRATEGY 2: Say, "Take out your notebooks. Draw a line in any direction. Draw a second line in a different direction. The lines should not be parallel." Draw the lines on the chalkboard.

e.g.,



Say, "Will these lines ever meet? ...cross? Extend each line in the direction you think will cause the two to meet and cross each other. Mark the point where they meet." Draw the following on the chalkboard.

e.g.,



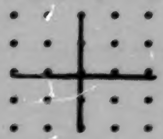
Say, "The point where the lines meet is called the intersection. Lines that cross each other are called intersecting lines. How many points of intersection do they have?" (1)

Continue this procedure.

4.09.02.03 **identify perpendicular lines as lines that form right angles**

STRATEGY 1: Prepare and distribute 5 x 5 dot paper and a ruler to each student. Say, "Draw a line through the middle row of dots. Draw a second line from the center dot in the top row down through the center dot in the middle row." Illustrate at the

STRATEGY 1: chalkboard.
cont'd e.g.,



Say, "Will the second line intersect the first line? Extend the second line so that it intersects the first line. Circle the point of intersection." Illustrate at the chalkboard. Say, "The angles formed by the intersecting lines are called right angles. How many right angles are formed where two lines intersect? (4) When two intersecting lines form right angles, the lines are called perpendicular lines."

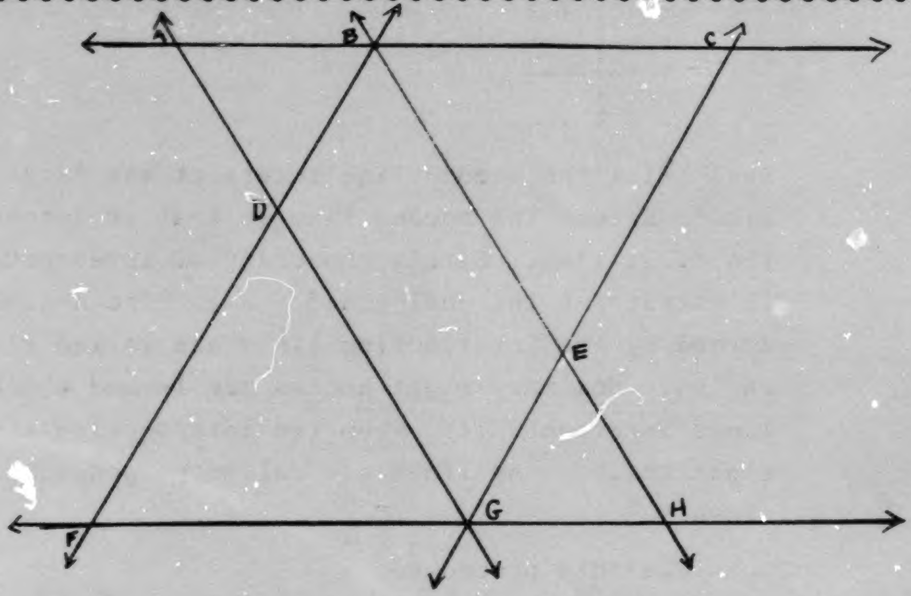
Continue this procedure.

STRATEGY 2: Distribute geoboards to groups of students. Say, "Make a horizontal line and a vertical line that intersect. What kind of angles do you see? They look like corners and are called right angles. Intersecting lines that form right angles are called perpendicular lines." Ask students to identify perpendicular lines found in objects in the classroom, e.g., desk, chalkboard.

P.O. 4.09.02.01-03

NAME: ______________________________ CLASS: __________ DATE: ________

Fill in the blanks.



AC and FH are perpendicular parallel lines.

FB and GC are intersecting parallel lines.

FB and AG are parallel intersecting lines.

CG and HB are parallel perpendicular lines.

GC and BH intersect ray at point E.

The angle formed at point E are left right angles.

Draw a set of parallel lines, intersecting lines and perpendicular lines.

4.07.01 DECIMALS HUNDREDTHS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.07.01.01A write any fraction with a denominator of 100 as a decimal;
e.g.,

$$\frac{27}{100} = 0.27$$

4.07.01.02A identify the place value of digits in decimals through hundredths.
e.g.,

$$6.31 \longrightarrow \overset{\text{ones}}{6}\;.\;\overset{\text{tenths}}{3}\;\;\overset{\text{hundredths}}{1}$$

4.07.01

VOCABULARY

TERMS

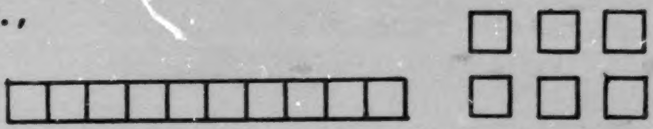
decimal
digit
hundredths
tenths

GETTING STARTED

Prepare and distribute a 100 bead frame to each student. Say, "Show 12 beads." Ask a student to come up to the chalkboard and write the fraction that shows this arrangement. ($\frac{12}{100}$) Say, "How many beads in all? (100) How many beads are we showing?" (12) Repeat this procedure for any number of beads from 1 through 100.

Prepare and distribute ten strips and units to each student. Write 1.6 on the chalkboard. Say, "We will call the ten strip one whole unit." Ask the students to show this number using their squared materials.

e.g.,



Say, "What does this number represent?" (1 and $\frac{6}{10}$)

Ask the students to use their material to show other decimals.

4.07.01

4.07.01.01 **write any fraction with a denominator of 100 as a decimal**

STRATEGY 1: Prepare and distribute squared materials to each student. Say, "The hundred card represents one whole and each unit piece represents one hundredth. Cover twelve squares with unit pieces. What part of the whole is this?" (12 out of one hundred) Ask a student to come to the chalkboard and write the fraction. ($\frac{12}{100}$) Say, "We can write $\frac{12}{100}$ as a decimal. We place a decimal point before the 12 to indicate twelve one hundredths."

Repeat this procedure for hundredths from 0.01 to 0.99.

STRATEGY 2: Prepare a bundle of 100 straws. Say, "Sharon wants 15 straws. What part of the bundle is that?" (15 out of 100) Ask a student to come to the chalkboard and write the fraction. ($\frac{15}{100}$) Say, "We can write $\frac{15}{100}$ another way. Write the numerator, 15, and place a decimal point two places to the left of the 15 to show hundredths." Write .15 on the chalkboard.

Repeat this procedure for any fraction between $\frac{1}{100}$ and $\frac{99}{100}$.

4.07.01.02 **identify the place value of digits in decimals through hundredths**

STRATEGY 1: Prepare and distribute squared material to each student. Draw the following place value chart on

STRATEGY 1: cont'd

the chalkboard.
e.g.,

Ones	.	Tenths	Hundredths

Write 172, 1.72 on the chalkboard. Say, "What is the value of the first number? (one hundred seventy two) the second? (one and 72 hundredths) What tells us that the numbers do not have the same value?" (decimal point) Write 1.72 in the place value chart. Say, "We have 1 whole, 7 tenths and 2 hundredths or 72 hundredths." Write 6.03 in the place value chart. Ask a student to read the number. Say, "This number has no tenths but we use the zero to show the two places necessary for hundredths." Continue this procedure using other numbers.

STRATEGY 2: Prepare a pocket place value chart labeled as indicated below, and three sets of cards numbered from zero through nine.
e.g.,

Ones	.	Tenths	Hundredths

Ask a student to choose a card from each pack and place them in the chart.
e.g.,

Ones	.	Tenths	Hundredths
4		8	3

Ask another student to read the number. (four and 83 hundredths) Say, "How many wholes? tenths? hundredths?"

Repeat this procedure using other cards.

P.O. 4.07.01.01

NAME: ____________________ CLASS: ________ DATE: ________

1. Write the decimal fraction.
2. Match the fraction and the decimal.
3. Circle the hundreths.

1) Write the decimal fraction.

$\frac{12}{100}$	$\frac{25}{100}$	$\frac{37}{100}$	$\frac{5}{100}$	$\frac{1}{100}$	$\frac{7}{100}$	$\frac{9}{100}$
____	____	____	____	____	____	____

2) Can you match ?

$\frac{4}{100}$	.12
$\frac{12}{100}$	.99
$\frac{26}{100}$	.04
$\frac{39}{100}$	.26
$\frac{99}{100}$	.39

3) Circle the hundreths.

.12

12

.02

400

2.19

.04

.2

1.6

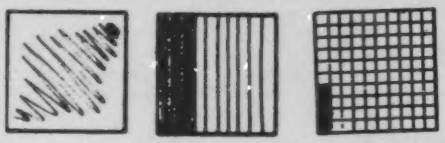
4.83

75

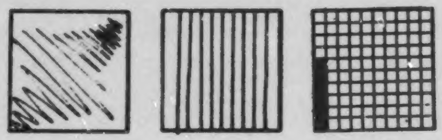
P.O. 4.07.01.02

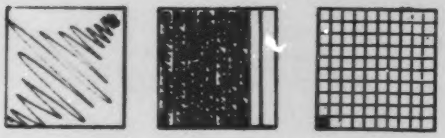
NAME: ______________________ CLASS: __________ DATE: ________

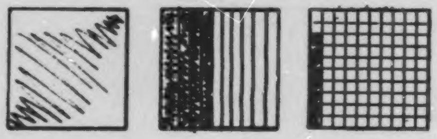
1. Write the decimal.
2. Write the place value of the circled digit.



1.34







8.④6

9.0⑦

6.2⑤

①.11

Unit 28

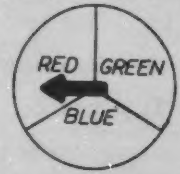
4.12.02 PROBABILITY
(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

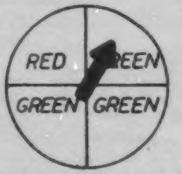
4.12.02.01A recognize zero probability;
e.g.,
The probability of 7 appearing when you roll one die is zero, since 7 is not one of the numbers on the die.

4.12.02.02A determine probabilities by comparing favorable outcomes with total possible outcomes;
e.g.,



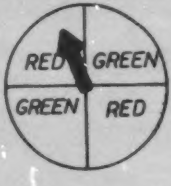
Since there are 3 equally likely outcomes, the probability of getting blue is 1 out of 3 or $\frac{1}{3}$.

4.12.02.03A recognize probabilities where the outcomes are not equally likely;
e.g.,



The probability of getting green would be 3 out of 4 or $\frac{3}{4}$.

4.12.02.04A recognize the conditions that must be met to produce an unbiased random sample.
e.g.,



Equal sections spinner spins freely.

4.12.02

VOCABULARY

TERMS

probability
outcome
possible

GETTING STARTED

Say, "Each morning, when Frank leaves for school, he meets Mrs. Saunders who lives a few doors away. On Monday, Tuesday and Wednesday, she was walking her dog, but on Thursday, she walked alone. How do you think Mrs. Saunders will be walking on Friday? (probably with have her dog) Why? (Most of the time, she has her dog.) How can we be sure? (We can't.) We can only take a good guess at what is possible."

Prepare a box of fifteen crayons; include two broken crayons in the box. Say, "Are there any broken crayons in this box? Can we be sure that none of the crayons are broken?" Distribute one crayon to each of fifteen students. Say, "Were any broken crayons? (yes) Can we say for sure that the crayons in the other boxes will not be broken? (no) We can only guess at what probably is correct."

4.12.02

4.12.02.01 recognize zero probability

STRATEGY 1: Prepare and distribute sets of colored rods to three students. Say, "Look at the colors." Ask a student to come the chalkboard to list the colors: white, red, light green, black, purple, yellow, brown, dark green, and orange. Distribute three more sets of rods. Say, "Check the colors in these sets. What are the chances that you will find a striped rod in the box? What are the chances that a striped rod will be found in the remaining boxes? There is no chance of finding a striped rod because these boxes have the same colors as the first box. When there is no chance of something happening, we say that there is zero probability of that happening."

STRATEGY 2: Prepare cards numbered from 0 through 9. Distribute three cards to each student. Say, "We are going to play a game." Ask a student to come the chalkboard and write one of his numbers. Repeat this procedure until all of the numbers have been written on the chalkboard. Say, "Does anyone have a card with a number we haven't listed? I have given out every card that I had. What are the chances of someone having a card numbered ten? (no chance) How do we know? (We listed all the numbers that we had in our hands, and ten wasn't one of the numbers.) Does anyone have a ten? There are no tens, and therefore, no chance of having a ten. When there is no chance of something happening, we say that there is zero probability of that event happening."

4.12.02

4.12.02.02 **determine probabilities by comparing favorable outcomes with total possible outcomes**

STRATEGY 1: Ask three students to come to the front of the room. Give one student a yellow cube, the second student a red cube and the third student a green cube. Say, "Put the cubes behind your back." Ask the seated students what color they think the first student has, and what chance it has of being red. Say, "Red is one chance out of three. There are three choices. Therefore, the chance that red is the first block to be selected is one out of three. We use the term probability; the probability of red being chosen is 1 out of 3 or $\frac{1}{3}$."

STRATEGY 2: Prepare a circular spinner with four colors. Ask four students to each choose a color. Say, "If you spin, at what colors might you stop? (blue, red, green or yellow) Do you think your color has a better chance of being selected? Why? There are four colors in all and each color has an equal space. Any one of the colors has one chance out of four of being selected. Using the term probability, we say that the probability of spinning any one color is 1 out of 4 or $\frac{1}{4}$."

4.12.02.03 **recognize probabilities where the outcomes are not equally likely**

STRATEGY 1: Prepare and distribute four sheets of construction paper, three red and one yellow. Say, "How many sheets did I give out?

STRATEGY 1: cont'd

There is one yellow sheet and three red sheets." Ask the students to hide the papers inside their desks. Say, "What color do you think the first student has? (red or yellow) The chance of having red is much better since there are so many more red sheets. There are four students with paper. Three have red. We say the probability of the first student having a red sheet is 3 out of 4, because three of the sheets are red. We express this as $\frac{3}{4}$."

STRATEGY 2:

Prepare and display a large spinner with four equal spaces. Write a student's name in three of the spaces and your name in the remaining space. Say, "I have a new pen. I will spin this spinner to see who will win the pen. How many chances does Susan have to win? (3) How many chances do I have? (1) I have 1 out of 4 possible chances and Susan has 3 out of 4 chances. We say that the probability of Susan winning the pen is 3 out of 4 or $\frac{3}{4}$."

4.12.02.04 **recognize the conditions that must be met to produce an unbiased random sample**

STRATEGY 1:

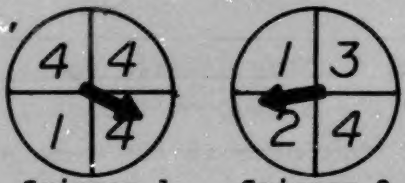
Say, "I would like to choose a student to be the book monitor." Ask four students to come to the front of the room. Write the names of two of these students on individual pieces of paper and fold them. Enter the third student's name on two individual pieces of paper and fold them. Do not write the fourth student's name at all. Place the folded papers in a box. Say, "I have one piece of paper with Gary's name, one with Felix, two with Jim." Ask a student to pick a name. Say, "Was

STRATEGY 1: cont'd

this fair? Wanda's name is not in the box, and Jim's name appears twice. This is not a fair or unbiased sample. In order to make a random, unbiased choice, all of the names must be in the box the same number of times. When this is done, the person picking the name knows that the one he picked was chosen without any preference."

STRATEGY 2: Prepare two spinners.

e.g.,



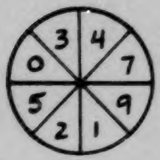
Spinner 1 Spinner 2

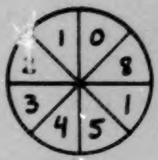
Say, "We would like to spin to choose a random (any) number from 1 through 4." Ask a student to spin the first spinner. Say, "What is happening?" (4 comes out more often) Show students the second spinner. Ask the students to compare the spinners. Say, "Spinner 2 has an equal distribution of the numbers." Ask a student to spin this spinner a few times. Say, "The numbers had the same chance. The number that comes up is an unbiased random selection. We did nothing to influence the possiblility of any number as we did with Spinner one."

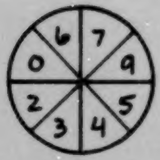
P.O. 4.12.02.01

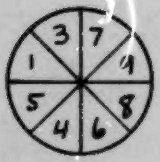
NAME:________________________________CLASS:________DATE:_______

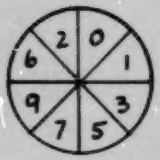
Choose the correct spinner.











1. Place a "1" under the spinner that has a zero probability of showing a 1.

2. Place a "2" under the spinner that has a zero probability of showing a 2.

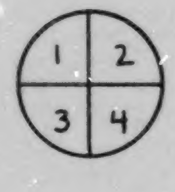
3. Place a "3" under the spinner that has a zero probability of showing a 4.

4. Place a "4" under the spinner that has a zero probability of showing a 7.

P.O. 4.12.02.02

NAME:________________________________ CLASS:__________ DATE:________

Write the probability for each event.



1. What is the probability that 4 will be selected by the spinner?

2. What is the probability that 3 will be selected by the spinner?

____

Ted for class President

Joe for class President

Stacey for class President

1. What is the probability that Joe will be elected?

____

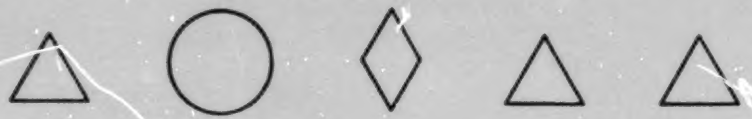
2. What is the probability that Stacey will be elected?

____

P.O. 4.12.02.03

NAME: ______________________________ CLASS: __________ DATE: ________

Write the probability for each event.



1. What is the probability of choosing a circle?

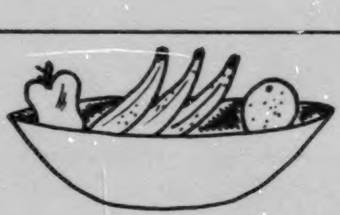
____

2. What is the probability of choosing a diamond?

____

3. What is the probability of choosing a triangle?

____



1. What is the probability that an apple will be eaten?

____

2. What is the probability that an orange will be eaten?

____

3. What is the probability that a banana will be eaten?

____

P.O. 4.12.02.04

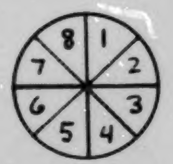
NAME:______________________________ CLASS:__________ DATE:________

Answer each question.

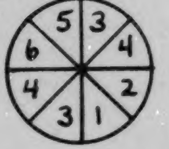
1. How many random numbers can be chosen by spinning a wheel that has numbers from one through three?

2. How many random numbers can be chosen by spinning wheel that has numbers from 1 through 4, with each number repeated twice?

3. Why won't this spinner produce random number from zero through 8?



4. Why won't this spinner produce a random number from 1 through 6?



5. True or False
    a. A student can make a choice when selecting a random number.
    b. In a group of random numbers, each number must have an equal distribution.

Unit 29

4.07.02 ORDER DECIMALS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.07.02.01A compare and order two or more decimals using the relation symbols > (less than), < (greater than), = (equal to); e.g.,

$0.39 < 0.52$

$2.4 > 2.38$

decreasing order 0.5, 0.48, 0.09

increasing order 2.95, 3.08, 3.61

4.07.02.02A recognize equivalency of decimals in tenths and hundredths. e.g.,

$0.5 = .\overset{\text{tenths}}{5}\ \overset{\text{hundredths}}{0}$

4.07.02

VOCABULARY

TERMS

tenths
hundredths

GETTING STARTED

Prepare cards with the following symbols <, >, = . Write two numbers on the chalkboard, e.g., 386 493. Ask a student to select the card with the sign that would make this number sentence true. (<) Vary the format of the numbers written on the chalkboard. e.g.,

$$10 + 3 \quad \boxed{>} \quad 4\overline{)16}$$

Continue this procedure using other numbers.

Write a fraction with ten as the denominator on the chalkboard. e.g.,

$$\frac{4}{10}$$

Ask a student to express this fraction as a decimal. (0.4) Write $\frac{4}{100}$ on the chalkboard. Ask a student to express this fraction as a decimal and write it on the chalkboard. (0.04) Continue this procedure changing fractions to decimals and decimals to fractions. e.g.,

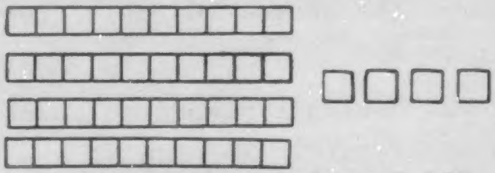
$$0.04 = \frac{4}{100}$$

4.07.02

4.07.02.01 compare and order two or more decimals using the relation symbols > (less than), <, (greater than), = (equal to)

STRATEGY 1: Prepare and distribute squared material to each student. Say, "The squares represent a whole, the ten strips represent tenths and the units represent hundredths. Using your material show 0.4 and 0.04."

e.g.,



Say, "Which is greater, 0.4 or 0.04? Take your square card and place the four tenths on top of it. Now place the four hundredths on top of the square. Which was closer to one whole?" (0.4) Write 0.4 > 0.04 on the chalkboard. Say, "Use your material to show 2.5 and 2.75. Which one do you estimate will be larger?" Ask a student to come to the chalkboard and write the inequality to express this relationship, e.g., 2.5 < 2.75.

Continue this procedure.

STRATEGY 2: Write the following problem on the chalkboard.

> There are two large cakes in a bakery, each cut into 100 squares. The first cake has chocolate frosting on 45 pieces. The second cake has cherry frosting on 75 pieces. Which cake has more frosting?

Ask a student to write a decimal to represent the chocolate cake on the chalkboard. (0.45) Ask another student to write a decimal for the cherry cake. (0.75) Say, "The cherry cake has more frosting." Write 0.75 > 0.45 on the chalkboard.

Continue this procedure.

4.07.02

4.07.02.02 **recognize equivalency of decimals in tenths and hundredths**

STRATEGY 1: Prepare and distribute squared materials to each student. Say, "The square represents one whole. The ten strip represents one tenth and the unit pieces represent hundredths. Use five strips to cover the whole. We used five tenths, and we write it as 0.5."

Say, "Use unit pieces to cover 50 squares on a hundred card. We used 50 hundredths. We write 50 hundredths as 0.50. Does the first card have more or less space covered than the second? (equal) 5 out of 10 is the same as 50 out of 100." Write on the chalkboard, 0.5 = 0.50.

Repeat this procedure using other numbers.

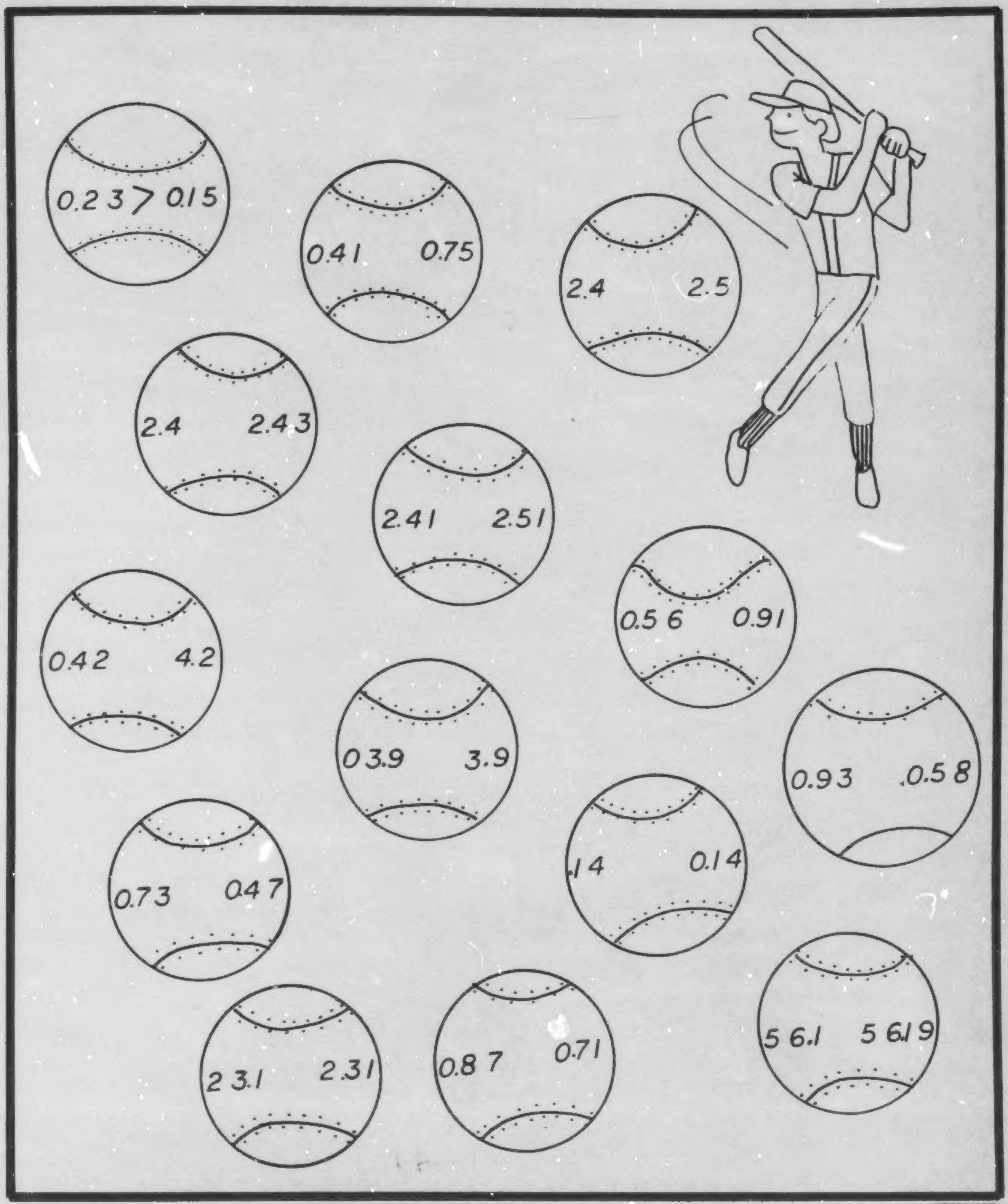
STRATEGY 2: Prepare and distribute 10x10 graph paper and two crayons to each student. Say, "How many strips of ten can you find? (10) What part of the whole is one strip? (0.1) Color four strips. Write the decimal for four strips." Write 0.4 on the chalkboard.

Use another sheet of paper and ask the students to shade 40 squares. Say, "Each square equals one hundredth." Write 0.40 on the chalkboard. Say, "Which paper has more boxes colored? (Both are the same.) 0.4 is equal to 0.40."

P.O. 4.07.02.01

NAME:______________________________CLASS:________DATE:_______

Use the symbol > (greater than) < (less than) = (equal) to compare each set of decimals.



0.23 > 0.15

0.41 0.75

2.4 2.5

2.4 2.43

2.41 2.51

0.56 0.91

0.42 4.2

03.9 3.9

0.93 .0.58

0.73 0.47

.14 0.14

23.1 2.31

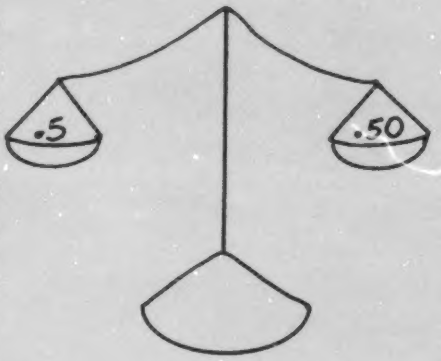
0.87 0.71

56.1 56.19

P.O. 4.07.02.02

NAME:____________________ CLASS:________ DATE:________

Match.



.4
.9
.7
1.3
.6
.3
.8
.2
.3
.1

.90
1.30
.60
.70
.30
.40
.10
.30
.20
.80

4.01.04 PRIME NUMBERS

(3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.01.04.01B recognize that a prime number has only two factors, one and itself;

e.g.,

2 is a prime number.
(2, 1) are factors.
1 is not a prime number.
1 is its only factor.

4.01.04.02B list all the prime numbers through one hundred;

e.g.,

2,3,5,7,11,13,17,19,23,29,31,37,41,
43,47,53,61,67,71,73,79,83,89,97

4.01.04.03B identify a composite number as any whole number having more than two factors;

e.g.,

16 (16 X 1, 4 X 4, 8 X 2)

4.01.04.04B rename a composite number as a product of its primes.

e.g.,

18 = 2 X 3 X 3

4.01.04

VOCABULARY

TERMS

factors
product
prime number
divisible
multiples

GETTING STARTED

Write 24 on the chalkboard. Say, "What two numbers when multiplied give the product 24."

e.g.,

$$24 = 1 \times 24 \qquad 24 = 3 \times 8$$

$$24 = 2 \times 12 \qquad 24 = 4 \times 6$$

Say, "The numbers in each pair are called factors, and 24 is the product."

e.g.,

$$24 = \underbrace{3 \times 8}_{\text{Factors}} \qquad 24 = \underbrace{4 \times 6}_{\text{Factors}}$$

Repeat this procedure using other numbers.

Draw a "Factor Chart" on the chalkboard.

e.g.,

Number	Factors	Number of Factors
2	1 2	2
3	1 2	2
4	1 2 4	3
6	1 2 3 6	4
8	1 2 4 8	4

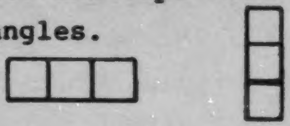
Ask the students to choose a number from 2 through 10, find its factors, and the number of factors. Ask the students to come to the chalkboard and write their findings in the appropriate columns on the "Factor Chart." Repeat this procedure using other numbers.

4.01.04

4.01.04.01 **recognize that a prime number has only two factors, one and itself**

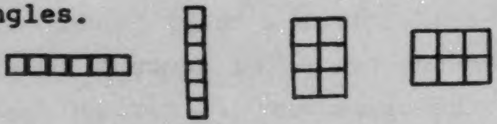
STRATEGY 1: Prepare 20 squares. Ask two students to use three squares and tape them to the chalkboard to form rectangles.

e.g.,



Ask two other students to use six squares and form rectangles.

e.g.,

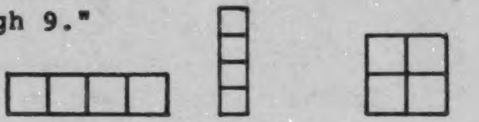


Say, "How many ways did we make a rectangle using three squares? (2) ...six squares? (4) Rectangles can help us to find the number of factors of a number. 3 has only 2 factors, 3 and 1. 6 has 4 factors, 6, 1, 3, and 2. A number that has only two factors, 1 and itself, is called a prime number."

Continue this procedure using other numbers.

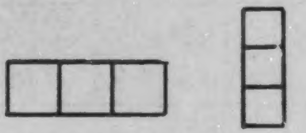
STRATEGY 2: Distribute 1" square graph paper to each student. Say, "Shade squares and form rectangles to show 2 through 9."

e.g.,



Say, "Identify all of the numbers that have only two rectangles. (2, 3, 5, 7) These numbers only have two factors." Draw the following on the chalkboard.

e.g.,



1 row of 3 squares.

Say, "A number whose only factors are 1 and itself is called a prime number."

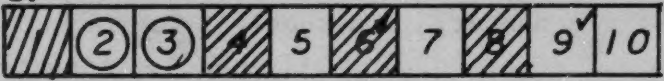
Continue this procedure using other numbers greater than 10.

4.01.04

4.01.04.02 **list all the prime numbers through one hundred**

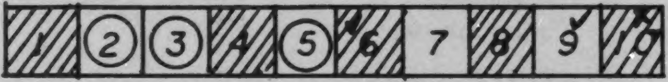
STRATEGY 1: Prepare large graph paper numbered 1 through 100 and tape it to the chalkboard. Say, "Many years ago people thought some numbers had magic powers. Lucky numbers had certain things in common. When multiplying, the only way to get that number was to multiply it by one. 11 was a lucky number. The factors of 11 are only 11 and 1. Today we call these numbers prime numbers. We are going to find all the prime numbers through 100. Open your workbooks to page 41b. Color in the number 1, circle the number 2 and color every second number after 2."

e.g.,



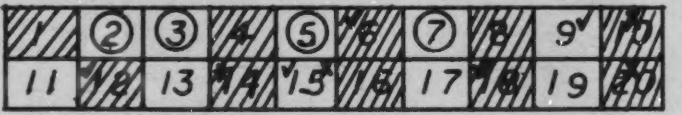
Say, "All of the numbers we colored have two as a factor. Circle the number 3 and make a check in every third box. Some numbers were already colored, that means they have 2 and 3 as factors. Circle the number 5 and make an X in every fifth number. Don't skip numbers already colored."

e.g.,



Say, "Circle the number 7 and make a star on every seventh number. Do not skip numbers already colored. Your first two rows should look like this." Point to the demonstration chart.

e.g.,



Say, "Circle all the numbers that are not marked. The circled numbers are primes. Their only factors are 1 and the number itself. How many primes are there?" (24) Point to the prime numbers that are circled.

4.01.04

STRATEGY 1: cont'd

Say, "We got rid of all the numbers that were not primes. We shook them out. Many years ago a Greek man named Eratosthenes discovered this method to find prime numbers. His discovery is called the Sieve of Eratosthenes. A sieve is like a sand sifter - we can sift away all the numbers that are not primes."

STRATEGY 2:

Prepare and distribute 10x10 graph paper. Say, "Write the numbers 1 through 100. A prime number is a number which has only two factors, 1 and the number itself."

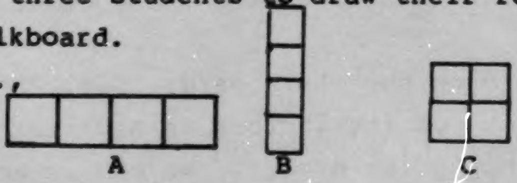
Divide the class into groups. Assign each group eleven numbers from 2 through 100. Say, "Determine which of your numbers are prime. Circle all of the prime numbers."

4.01.04.03 **identify a composite number as any whole number having more than two factors**

STRATEGY 1:

Prepare and distribute graph paper. Say, "On your graph paper trace a rectangle that has four boxes." Ask three students to draw their rectangles on the chalkboard.

e.g.,



Point to rectangle A. Say, "What multiplication fact describes this rectangle? (1x4)...B? (4x1)... C?" (2x2) Write the facts under the pictures. Say, "How many factors does 4 have? (3) What are they? (4,1,2) Any number that has more than two factors is called a composite number."

Continue this procedure using other numbers.

STRATEGY 2: Adapt Strategy 1 used in P.O. 4.01.04.02 to teach composite numbers.

4.01.04.04 **rename a composite number as a product of its primes**

STRATEGY 1: Ask the students to find all of the factors of 8. Write 1, 8, 2, 4 on the chalkboard. Say, "How many factors does 8 have? (4) Is 8 prime or composite? (composite) How do you know? (It has more than two factors.) We are going to rename 8 using only prime numbers. What pair of numbers other than 8 x 1 can be multiplied to get 8?" (4 x 2) Write 4 x 2 on the chalkboard. Say, "What pair of numbers can be multiplied to get 4? Do not use one as a factor." (2 x 2) Write the following on the chalkboard. e.g.,

8 = 4 x 2
8 = 2 x 2 x 2

Say, "Is 2 prime or composite? (prime) Since 2 is a prime number we do not have to factor 2. We renamed 8 as a product of its primes."

Continue this procedure using other numbers.

STRATEGY 2: Write 8 on the chalkboard. Say, "8 has 4 factors. Only one of its factors is a prime number. 2 is the only prime number. We can rename 8 using only 2 as a factor." Write 8 = 2 x 2 x 2 on the chalkboard.

Continue this procedure using other numbers.

P.O. 4.01.10.01

NAME: ____________________ CLASS: ________ DATE: ________

Draw circles for these numbers to form rectangles or squares. In each direction there must be at least two circles. Put a square around the numbers that do not fit this pattern.

$\boxed{2}$ ○○	$\boxed{3}$ ○○ ○	4 ○○ ○○	$\boxed{5}$ ○○○ ○○
6	7	8	9
10	11	12	13
14	15	16	17
18	19	20	21
22	23	24	25

P.O. 4.01.10.02

NAME: ________________ **CLASS:** ________ **DATE:** ________

Color in number. Circle two and color every second box. Circle three and put a check in third box. Circle five and make an x in every fifth box. Circle seven and make a * in every seventh box. Circle all the numbers that are unmarked.

11 5 1

3 43

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

List the circled numbers:

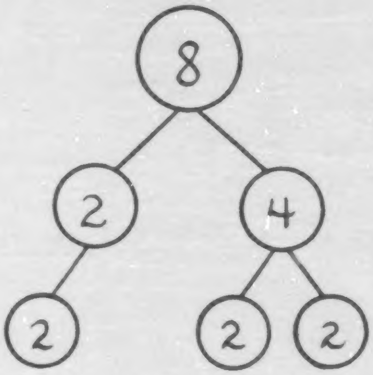
2 3 5 7 11 13

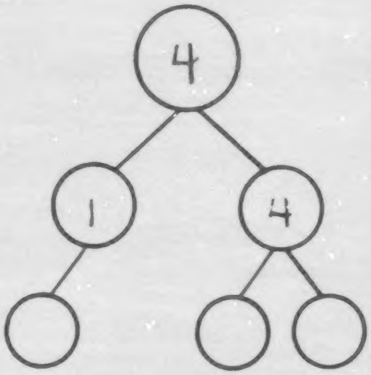
360

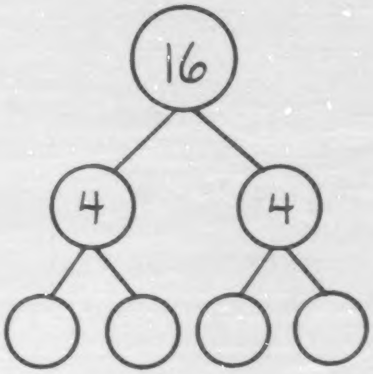
P.O. 4.01.04.04

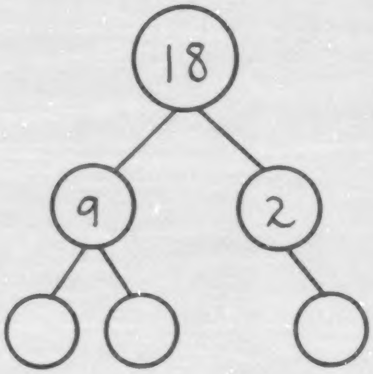
NAME: ______________________ CLASS: __________ DATE: ________

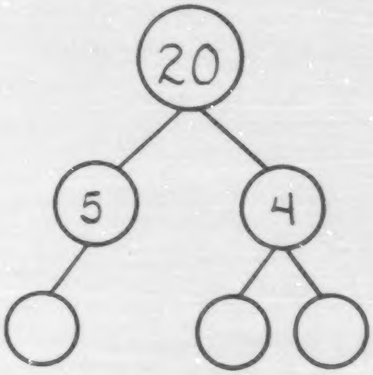
Rename each number as a product of its primes.

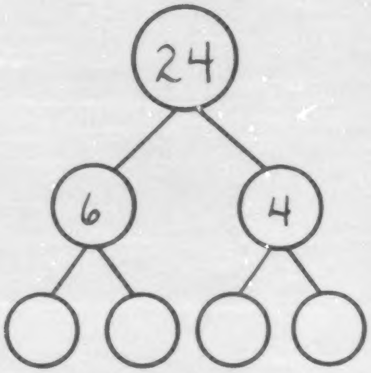












4.09.03 PROPERTIES OF A CIRCLE

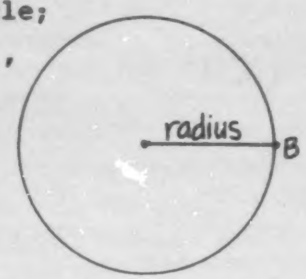
(1-2 lessons)

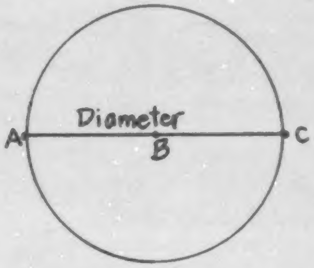
PERFORMANCE OBJECTIVES

The student will be able to...

4.09.03.01B identify a radius and a diameter of a circle;

e.g.,



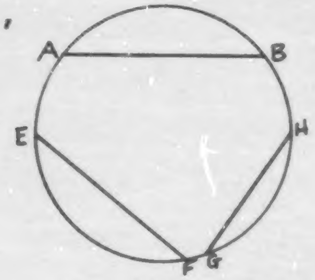


$\overline{AB}$ is the radius because it's the line from the center to the outer edge of the circle.

$\overline{AC}$ is a diameter because it is a chord that passes through the center.

4.09.03.02B identify the chords of a circle.

e.g.,



$\overline{AB}$, $\overline{EF}$ and $\overline{GH}$ are chords because their end points are on the circle.

4.09.03

VOCABULARY

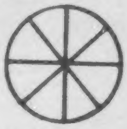
TERMS

radius
diameter
chord

GETTING STARTED

Prepare toy cars with moveable wheels. Say, "What shape are the wheels?" Rotate the wheels to show that a circle is round, has a continuous side and no corners. Say, "A circle has a center." Draw the following on the chalkboard.

e.g.,



Say, "When we look at a bicycle wheel we see that the spokes all come from the center."

Prepare and display various objects that are circular, e.g., doughnut, clock, snowman. Say, "How are these shapes alike? What do we know about circles?" (round, continuous side, center) Ask the students to name other circular shapes in our environment.

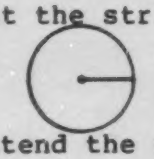
4.09.03

4.09.03.01 **identify a radius and a diameter of a circle**

STRATEGY 1: Prepare a piece of string. Draw a large circle on the chalkboard. Ask a student to draw a dot in the center. Give the student a length of string and ask him/her to extend the string from the center to the outside of the circle.

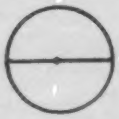
Say, "We call this length or line segment, which goes from the center to the outer edge, the radius of this circle." Draw a radius in the circle to represent the string.

e.g.,



Say, "Extend the string from one edge of the circle to the other. Be sure to pass through the center. This is the diameter of the circle." Draw a diameter in the circle on the chalkboard.

e.g.,



STRATEGY 2: Prepare and distribute small paper circles. Say, "We would like to decorate this birthday cake. Place a dot in the center of the circle. We would like to make lines of icing going from the center to the outer edge. The line that goes from the center to the edge of the circle is called the radius. It begins at the center and can be drawn in any direction to the outer edge." Ask the students to draw some radii in their circle.

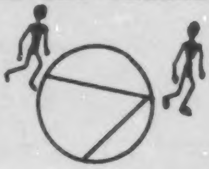
Say, "Turn your circle over and draw a line from one edge to another passing through the center. First we find the center and then draw the line from one edge to the other. We call this line the diameter."

4.09.03

4.09.03.02 **identify the chords of a circle**

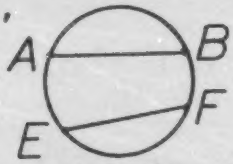
STRATEGY 1: Draw a large circle on the floor. Ask a few students to stand around the circle. Say, "We are going to play a game. When your back is tapped, you can walk to another edge of the circle. The person at that point then walks to a different edge. You will be out if you don't stand at the edge." Draw a cicle on the chalkboard and illustrate the paths.

e.g.,



Say, "What do we call these paths? (line segments) How do you know? (Each has two end points.) Where are the end points? (on the edge of the circle) A line segment that has end points on the circle is called a chord. This line does not go through the center of the circle. If it did, it would be a diameter."

e.g.,



AB and EF are chords.

STRATEGY 2: Prepare and distribute a paper circle and a ruler to each student. Say, "Draw a line from one edge of the circle to another. Label the line segment $\overline{AB}$. In a circle there is a special name for these line segments. They are called chords." Ask the students to draw other chords. Say, "A chord does not go through the center of the circle. If it did, it would be called a diameter."

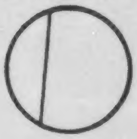
P.O. 4.09.03.01

NAME: ____________________ CLASS: __________ DATE: ________

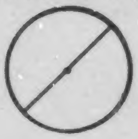
Follow the directions next to each number.

① Circle the radius.

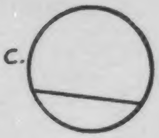
a.



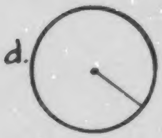
b.



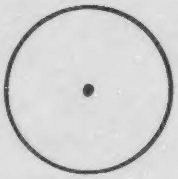
c.



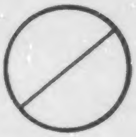
d.

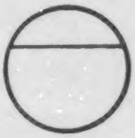


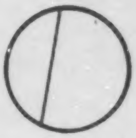
② Draw as many radii for this circle that you can. (Use a ruler.)

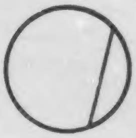


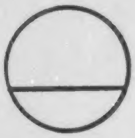
③ Put an X under the circle that shows a diameter.



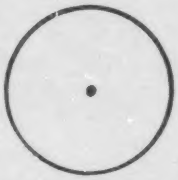








④ Draw as many diameters for this circle that that you can.

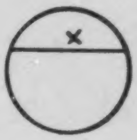


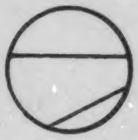
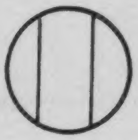
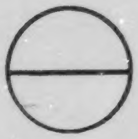
P.O. 4.09.03.02

NAME:______________________________CLASS:_________DATE:________

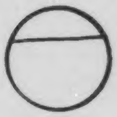
1. Place an X on each chord.
2. Match
3. Use letters to name the chords. List each chord.
4. Construct a shape inside each circle. Name the chords.

① Place an X on each chord.

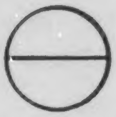


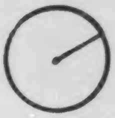
② Match



Radius

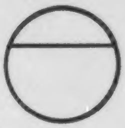
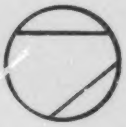
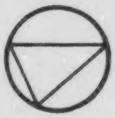


Diameter



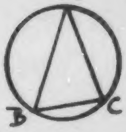
Chord

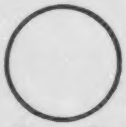
③ Use letters to name the chords. List each chord.

④ Construct a shape inside each circle. Name the chords.

$\overline{AB}$
$\overline{AC}$
$\overline{BC}$





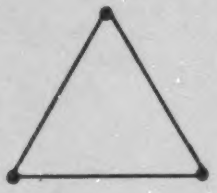
4.09.04 TRIANGLES

(1-2 lessons)

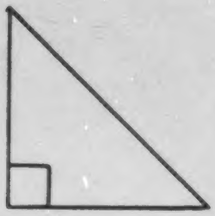
PERFORMANCE OBJECTIVES

The student will be able to...

4.09.04.01B recognize that three points not on a straight line determine a triangle; e.g.,



4.09.04.02B identify a triangle with one right angle as a right triangle. e.g.,



4.09.04

VOCABULARY

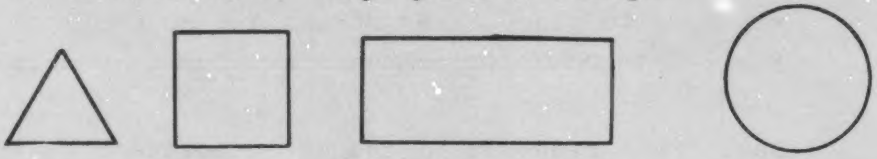
TERMS

right triangle

GETTING STARTED

Prepare a collection of large geometric shapes.

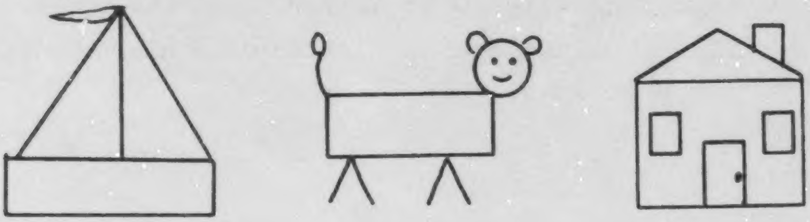
e.g.,



Ask the students to identify each shape. Say, "How many sides does each shape have? ...angles?" Ask the students to look around the classroom and find objects that have these shapes.

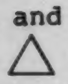
Prepare and distribute pipe cleaners to each student. Ask the students to make squares, rectangles and triangles using the pipe cleaners. Say, "See if you can attach your shapes to make a picture."

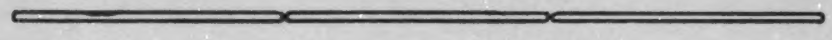
e.g.,



4.09.04

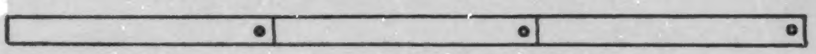
4.09.04.01 **recognize that three points not on a straight line determine a triangle**

STRATEGY 1: Distribute three straws to each student and ask students to construct a triangle, e.g.,  Say, "How many points does a triangle have?" (3) Ask students to place three straws end to end.

e.g., 

Say, "This figure also has three points. Is it a triangle? In a triangle the points cannot be in a straight line."

STRATEGY 2: Prepare and display three strips of oak tag. Connect each strip with a paper fastener to form a triangle, e.g., Say, "What is the name of this figure? (triangle) How many points does it have? (3) Take out one connecting clip and let the strips lay flat."

e.g., 

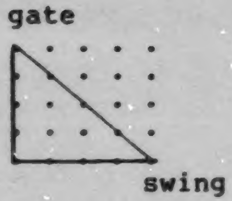
Say, "This figure has three points. Is it a triangle? If the points are in a straight line, the figure is not a triangle."

4.09.04.02 **identify a triangle with one right angle as a right triangle**

STRATEGY 1: Prepare and distribute geoboards to each student. Say, "Carlos is riding his bike in the playground. He rode to the gate, made a right turn and then rode to the swings and then went back to the gate. Let's show this on the geoboard."

STRATEGY 1: cont'd

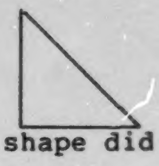
e.g.,



Say, "An angle was formed when Carlos made the turn. It looks like a corner. This angle is called a right angle. What shape was formed when Carlos went back to the gate? (triangle) This triangle has a right angle as one of its angles. It is called a right triangle. A right triangle has a right angle."

STRATEGY 2: Prepare and distribute colored rods to each student. Ask the students to choose two rods. Say, "Using your rods make the letter L. What else does this look like? (corner) This corner is a special kind of angle. It is a right angle. We can close this figure and make a shape. Choose another rod and close this figure."

e.g.,

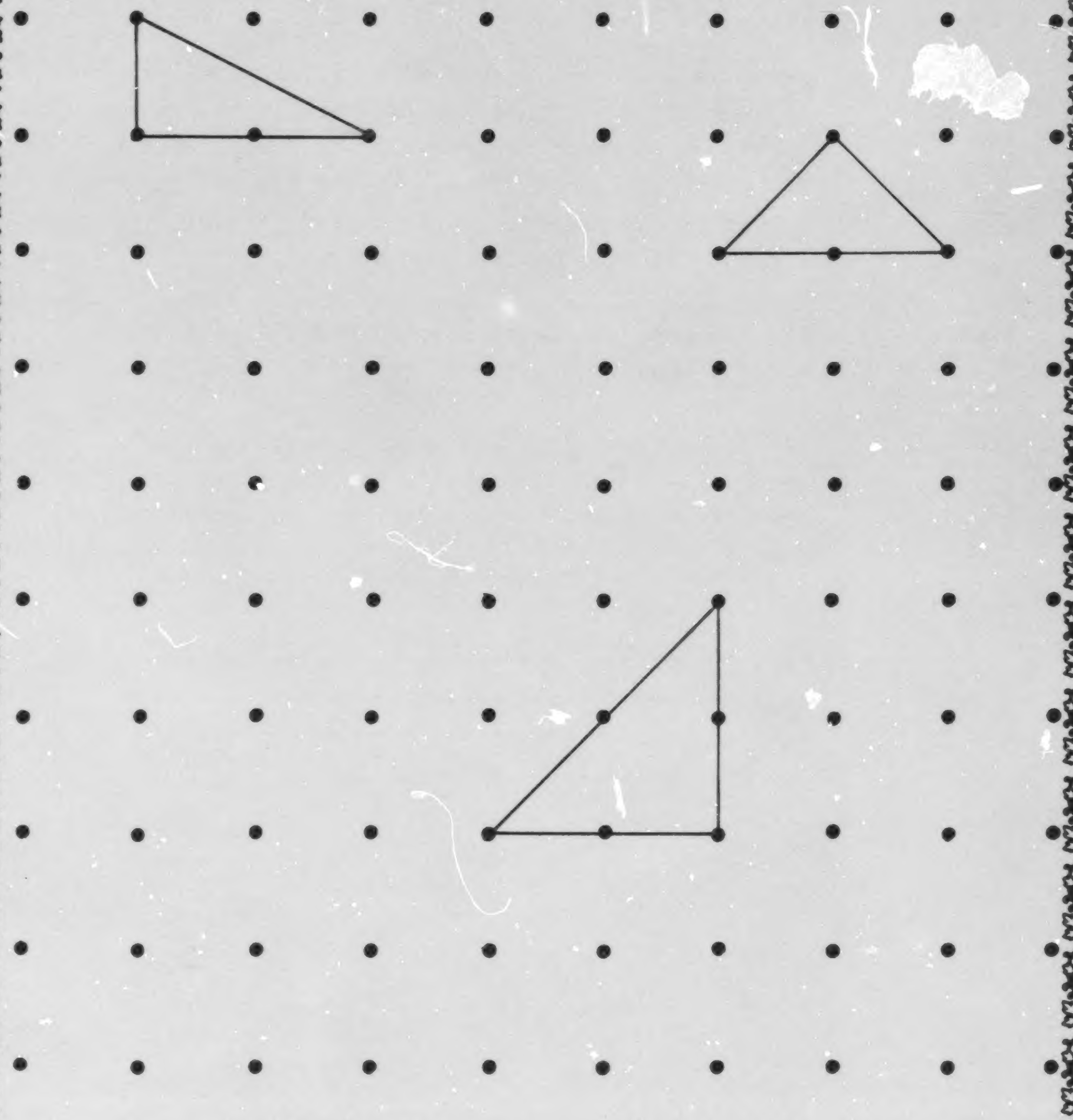


Say, "What shape did you make? (triangle) When a triangle has a right angle, it is called a right triangle." Ask the students to choose different rods and make other right triangles.

P.O. 4.09.04.01

NAME:______________________CLASS:__________DATE:________

How many triangles can you make?

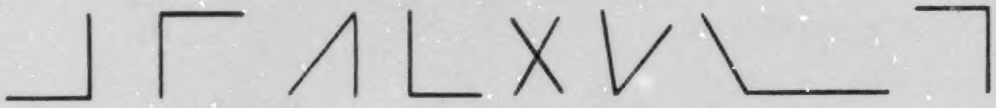


P.O. 4.09.04.02

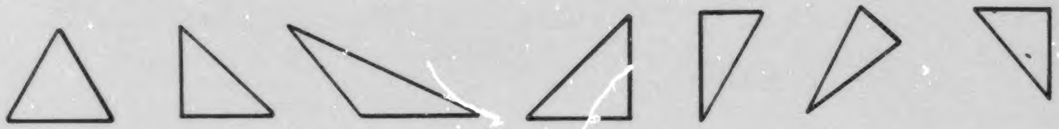
NAME:______________________________ CLASS:________ DATE:______

I. Circle the right angles.
II. Circle the right triangle.
III. How many right triangles can you find.

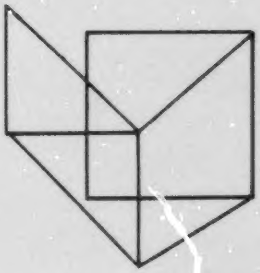
I



II



III



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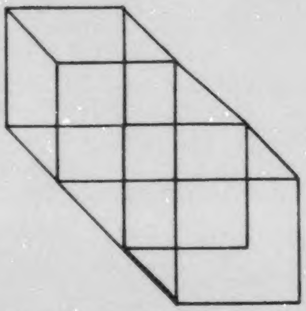

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4.06.04 IMPROPER FRACTIONS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.06.04.01A identify improper fractions and mixed numbers;

e.g.,

$\frac{6}{3}$	$1\frac{3}{4}$
improper fraction	mixed number

4.06.04.02A change an improper fraction to a mixed number.

e.g.,

$\frac{5}{3}$	$1\frac{2}{3}$
improper fraction	mixed number

4.06.04

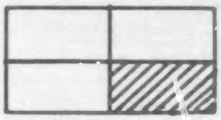
VOCABULARY

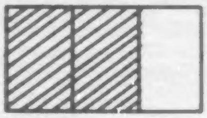
TERMS

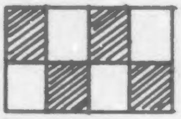
numerator
denominator
fraction
improper fraction
mixed numbers

GETTING STARTED

Draw the following figures on the chalkboard.

1. 

2. 

3. 

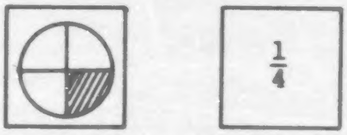
Say, "Look at the first figure. How many equal parts are in this shape? (4) How many parts are shaded? (1) How many parts are not shaded?" (3)

Write the fractions $\frac{1}{4}$ and $\frac{3}{4}$ on the chalkboard. Point to the numerators and denominators.

Say, "What is the same in the two fractions? (denominator) The denominator tells the number of equal parts. What is different about the fractions? (numerator) The numerator tells the number of parts about which we are talking." Continue this procedure for the other drawings.

Prepare two sets of cards. On one set draw shapes with different fractions shaded. On the second set write the fraction which represents these drawings.

e.g.,



Place the cards face down in two rows. Say, "We are going to play 'Concentration'." Ask a student to select one card from each row. If they match, the student goes again. If they do not match, the student must put the cards back and another student has a turn.

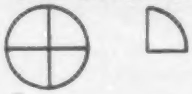
Play continues until all cards have been matched.

4.06.04

4.06.04.01 **identify improper fractions and mixed numbers**

STRATEGY 1: Prepare fractional parts and a flannel board. Say, "How many thirds equal one whole? How many fourths? How many eighths? How can we tell if a fraction equals one whole? (The numerator and the denominator are the same.) A fraction whose numerator is larger than the denominator is called an improper fraction." Write $\frac{5}{4}$ on the chalkboard. Ask a student to show $\frac{5}{4}$ using the fractional parts.

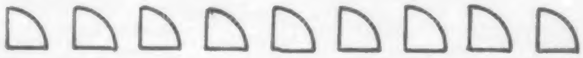
e.g.,



Say, "$\frac{5}{4}$ is an improper fraction. How many wholes does it have? (1) How many fourths left over?" (1) Write $1\frac{1}{4}$ on the chalkboard. Say, "$1\frac{1}{4}$ is called a mixed number." Ask the students to name other improper fractions and mixed numbers.

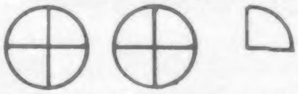
STRATEGY 2: Place nine fourths on the chalkboard.

e.g.,



Say, "How many fourths do we have?" (9) Write $\frac{9}{4}$ under the illustration. Say, "Is $\frac{9}{4}$ greater than one whole? $\frac{4}{4}$ equals one whole and there are more than 4 fourths. A fraction that is greater than one whole, and whose numerator is larger than the denominator, is called an improper fraction." Ask a student to come to the chalkboard and make wholes.

e.g.,



Say, "How many wholes do we have in all? (2) What fraction do we have left? ($\frac{1}{4}$) $2\frac{1}{4}$ is called a mixed number. A mixed number is a whole number and a fraction." Repeat the same procedure using other fractions.

4.06.04

4.06.04.02 **change an improper fraction to a mixed number**

STRATEGY 1: Prepare fractional parts (halves, thirds, and fourths) and a flannel board. Place $\frac{5}{2}$ on the flannel board. Say, "How many halves do you see?" (5) Write $\frac{5}{2}$ on the chalkboard. Say, "What type of fraction is $\frac{5}{2}$? (improper fraction) How many wholes can be made with the halves? (2) How many halves are left? (1) What mixed number do we have?" ($2\frac{1}{2}$) Write $\frac{5}{2} = 2\frac{1}{2}$ on the chalkboard. Say, "Look at the equation on the chalkboard. What did I do? I changed an improper fraction to a mixed number. Divide the fraction into wholes and then add the fractional part that is left. Divide the denominator into the numerator to find the number of wholes. The remainder is the fraction."

e.g.,

$\frac{5}{2}$ means $\overset{2\text{R}1}{2\overline{)5}}$ $\qquad$ $\overset{2\frac{1}{2}}{2\overline{)5}}$

STRATEGY 2: Prepare index cards. Say, "I have five index cards to divide between two people." Write $\frac{5}{2}$ on the chalkboard. Say, "What kind of fraction is $\frac{5}{2}$? (improper) I can write $\frac{5}{2}$ as a division example." Write $5 \div 2$ or $2\overline{)5}$ on the chalkboard. Ask a student to divide.

e.g.,

$$\begin{array}{r} 2\text{R}1 \\ 2\overline{)5} \\ \underline{4} \\ 1 \end{array} \qquad \begin{array}{r} 2\frac{1}{2} \\ 2\overline{)5} \\ \underline{4} \\ 1 \end{array}$$

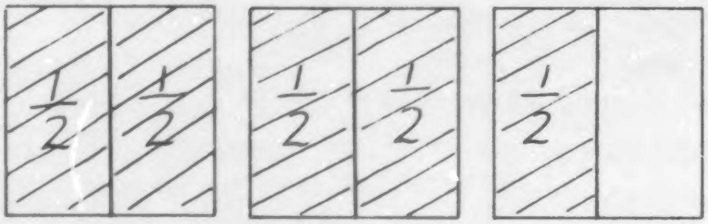
Say, "When there is a remainder, write it as a fraction."

Repeat the procedure using other examples.

P.O. 4.06.04.01

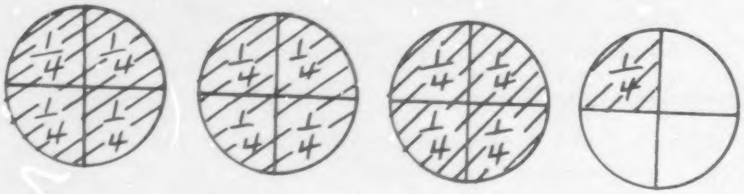
NAME: ______________________ CLASS: __________ DATE: __________

How many parts are shaded? Write the number in two ways.


1/2
1/2
1/2
1/2
1/2

$= \frac{5}{2}$ improper fraction

$2\frac{1}{2}$ mixed numeral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= ______________

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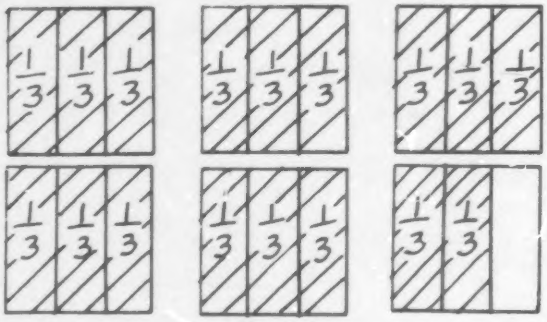
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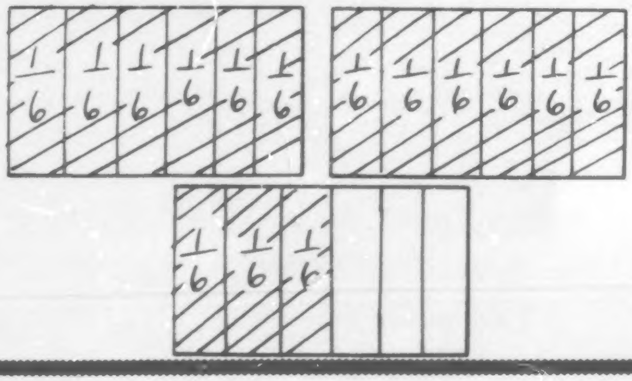
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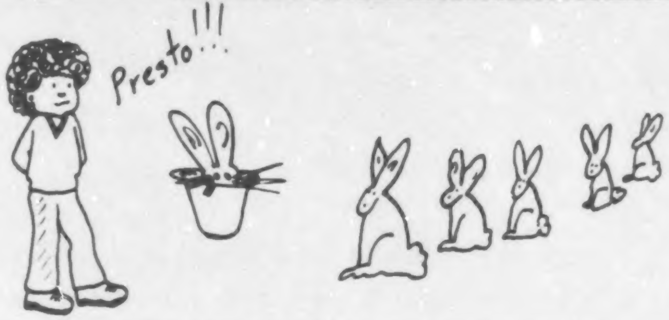
P.O. 4.06.04.02

NAME: ______________________ CLASS: ________ DATE: ______

Change each improper fraction to a mixed number. Show your work.



$\frac{5}{3} = 1\frac{2}{3}$ $3\overline{)5}$ quotient $1\frac{2}{3}$ -3 2	$\frac{4}{3}$
$\frac{7}{2}$	$\frac{13}{6}$
$\frac{19}{8}$	$\frac{25}{4}$
$\frac{19}{5}$	$\frac{22}{3}$

Unit 34

4.10.03 CUSTOMARY CAPACITY RELATIONSHIPS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.10.03.01A	identify and compare the number of ounces in a cup, a pint, a quart and a gallon; e.g., 1 cup = 8 ounces 1 pint = 16 ounces 1 quart = 32 ounces 1 gallon = 128 ounces
4.10.03.02A	identify the relationships among cups, pints, quarts and gallons; e.g., 2 cups = 1 pint 2 pints = 1 quart 4 quarts = 1 gallon
*4.10.03.03A	use measuring skills to follow the directions in a recipe. e.g., $\frac{1}{2}$ tbsp., $\frac{1}{4}$ cup

4.10.03

VOCABULARY

TERMS

ounces
cup
pint
quart
gallon

GETTING STARTED

Prepare containers of various shapes and capacities, e.g., cup, pint, quart and gallon. Allow students to experiment by comparing the volume of various containers using water, rice or beans.

Ask the students to find the labels to identify cup, pint, quart and gallon containers. Discuss products that are sold in these size containers. Say, "Why do foods come in standard sizes?" (So people know how much they are getting.)

Display ordinary containers such as cups, pints, quarts and gallons on a table in front of the room. Discuss common items that come in containers like these, e.g., milk, juice, soda, vegetables, oil. Ask a student to place the containers in order from smallest to largest. Ask another student to read the label of each container to determine cups, pints, quarts and gallons.

4.10.03

4.10.03.01 **identify and compare the number of ounces in a cup, a pint, a quart and a gallon**

STRATEGY 1: Prepare cup, pint, quart and gallon containers, water or a pourable solid, e.g., rice, and 8 oz. paper cups. Ask the students to identify a cup, a pint, a quart and a gallon by reading the labels on the containers. Distribute paper cups. Say, "One cup equals eight ounces. Find how many 8 oz. cups are needed to fill a pint, a quart and a gallon container." Ask a student to record the results. After the students have completed measuring and recording, ask a student to come to the chalkboard to complete the chart.

e.g.,

1 cup = _____ oz.
1 pint = _____ oz.
1 quart = _____ oz.
1 gallon = _____ oz.

STRATEGY 2: Prepare cup, pint, quart and gallon containers. Display a filled cup. Say, "Estimate how many cups will be needed to fill the other containers." Fill the pint, quart and gallon containers while a student records the results on the chalkboard.

e.g.,

2 cups = 1 pint
4 cups = 1 quart
16 cups = 1 gallon

Say, "To determine how many ounces are in a pint, quart or gallon, we need only know the number of ounces in a cup. A cup is equivalent to 8 ounces." Ask the students to complete the following chart.

e.g.,

1 cup = 8 oz.
1 pint = 2 cups = ___ oz.
1 quart = ___ cups = ___ oz.
1 gallon = ___ cups = ___ oz.

4.10.03

4.10.03.02 **identify the relationships among cups, pints, quarts and gallons**

STRATEGY 1: Prepare cup, pint, quart and gallon containers and a large amount of beans.

Ask a student to fill the cup with beans and pour it into the pint container. Say, "Does this cup fill the pint container? (no) Fill another cup and empty it into the pint container. Is the pint filled? (yes) How many cups were needed to fill a pint container?" (2)

Write 2 cups = 1 pint on the chalkboard. Repeat this procedure to fill the other containers, e.g., pints into quarts, quarts into gallons.

STRATEGY 2: Prepare cup, pint, quart and gallon containers and a pourable substance, e.g., water, beans. Divide the class into five groups. Ask group 1 to find the number of cups in a pint; group 2, the number of pints in a quart; group 3, the number of quarts in a gallon; group 4, the number of cups in a quart, and group 5, the number of cups in a gallon.

After the students have found the relationships, write the following chart on the chalkboard.
e.g.,

___ cups = 1 pint ___ cups = 1 quart
___ pints = 1 quart ___ cups = 1 gallon
___ quarts = 1 gallon

Ask a student from each group to fill in the chart.

4.10.03.03 **use measuring skills to follow the directions in a recipe**

4.10.03

STRATEGY 1: Display the recipe to make lemonade to the class. Say, "There is more to following a recipe than just measuring ingredients." Follow the recipe with the class.

Lemonade

Equipment: pitcher, mixing spoon and measuring cup

Ingredients: $\frac{1}{2}$ cup of honey
$\frac{1}{2}$ cup of lemon juice
(or squeeze 6 lemons)
1 quart of water

How to make:

1) Add the lemon juice and honey to the water.
2) Stir until the honey dissolves.
3) Chill in the refrigerator.
4) Add ice cubes, if needed, and serve.

STRATEGY 2: Say, "Why do we need standard units of capacity measurement?" Make a list on the chalkboard. e.g.,

Measuring gasoline for a car

Say, "We are going to make a fruit punch by following a recipe."

Party Punch

Combine 1 cup orange juice, $\frac{1}{4}$ cup of lemon juice, 1 pint of cranberry juice cocktail, 1 cup of pineapple juice and one pint of apple cider. Mix well. Before serving, pour over ice in a punch bowl and add ginger ale. Makes about 30 punch cups.

Ask students to list the ingredients and the equipment needed. Ask a student to come up and measure it into a container. Have another student measure $\frac{1}{4}$ cup of lemon juice and add it to the container repeat for all ingredients. Discuss what measures were used. Serve.

P.O. 4.10.03.01

NAME:____CLASS:_________DATE:________

Complete the table on the top of the page.
Use the table to complete the page.

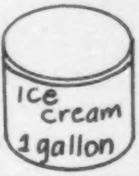
1 cup = 8 oz.
1 pint = __oz.
1 quart = __oz.
1 gallon = __oz.

1) Jane's mother used 5 cups of water to make lemonade. How many ounces of water did she use?________

2) The label on the juice bottle says "1 pint and 8 ounces." How many ounces is this?____________

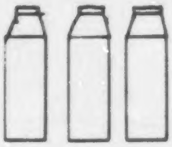
3) How many ounces are in this quart of milk?___________

4) How many ounces of ice cream are in this container?______



5) How many ounces are in 3 quarts of milk?

____



6) Mrs. Brown's baby drinks 6 four ounce bottles of formula each day. How many pints of formula does she need to buy each day?_____________

7) Complete the chart.

cups	1	2	3	4
ounces	8			

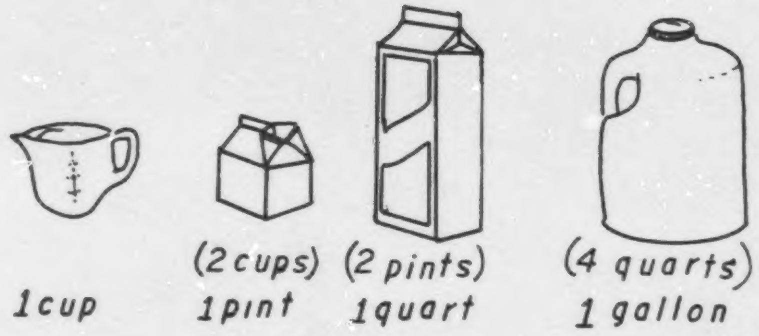
8) Complete the chart.

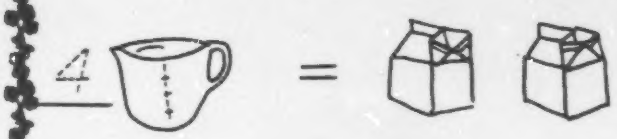
quarts	1	2	3	4
ounces	32			

P.O. 4.10.03.02

NAME:______________________ CLASS:__________ DATE:________

Fill in the blanks.


1cup
(2cups)
1pint
(2 pints)
1quart
(4 quarts)
1 gallon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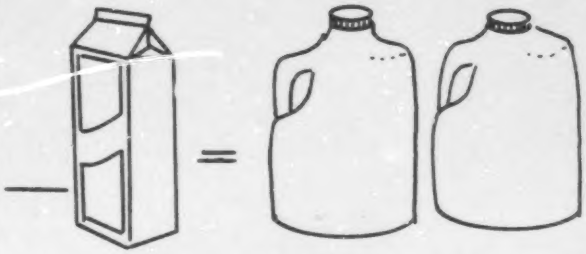
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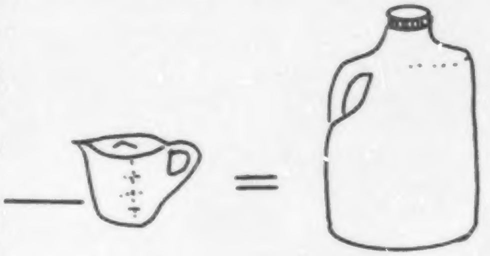
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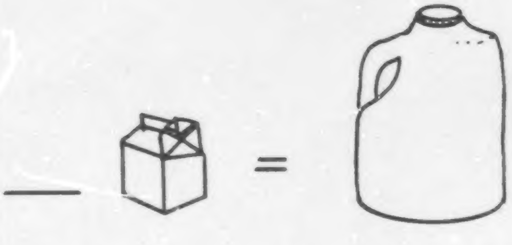
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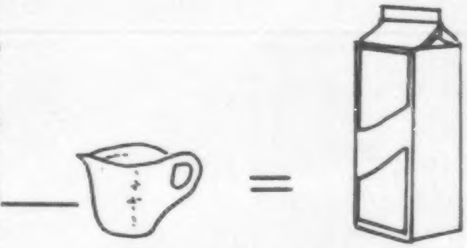
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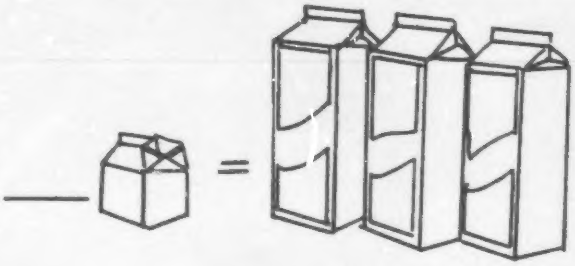
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P.O. 4.10.03.03

NAME:______________________________**CLASS:**__________**DATE:**________

Read the recipe on the top of the page.
Answer each question.

COCOA

Combine 4 tablespoons of cocoa, 4 tablespoons of sugar and a pinch of salt in a saucepan. Add 1 cup of cold water and boil for 2 minutes. Stir while it is boiling. Add 3 cups of whole milk; heat throughly but do not boil. Add 1 teaspoon of vanilla extract. Beat with a rotary egg beater. Makes six servings.

1. What are the 6 ingredients you will need to make the cocoa? __________, ___________, __________, _________, ___________, ___________,
2. What measuring equipment will you need? ____.
3. How many servings will this receipe make? ____.
4. How many cups of milk would you need to add if you wanted to make 12 servings? _____________.
5. Try this recipe at home with your mother.
   How did you like it? ________________________.
   How long did it take? ________________________.

4.06.05 ADDITION AND SUBTRACTION OF FRACTIONS WITH COMMON DENOMINATORS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.06.05.01A add fractions;
e.g.,

$$\frac{1}{10} + \frac{3}{10} = \frac{4}{10}$$

4.06.05.02A subtract fractions;
e.g.,

$$\frac{7}{10} - \frac{4}{10} = \frac{3}{10}$$

4.06.05.03A add mixed numbers;
e.g.,

$$\begin{array}{rcl} 5\,\frac{1}{4} & = & 5 + \frac{1}{4} \\ \underline{+1\,\frac{1}{4}} & = & \underline{1 + \frac{1}{4}} \\ & & 6 + \frac{2}{4} = 6\frac{2}{4} \end{array}$$

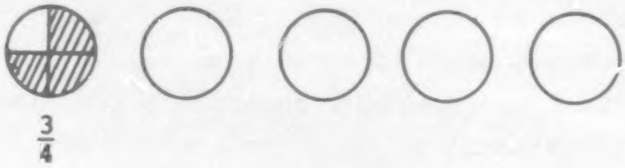
4.06.05.04A subtract mixed numbers.
e.g.,

$$\begin{array}{rcl} 5\,\frac{3}{4} & = & 5 + \frac{3}{4} \\ \underline{-1\,\frac{2}{4}} & = & \underline{1 + \frac{2}{4}} \\ & & 4 + \frac{1}{4} = 4\frac{1}{4} \end{array}$$

GETTING STARTED

Draw five circles on the chalkboard. Ask a student to come to the chalkboard and divide the first circle into fourths. Ask another student to shade three-fourths of the circle. Ask a third student to write the fraction that describes this circle.

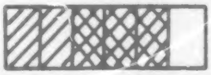
e.g.,



Continue this procedure for eighths, sixths, fifths and sixteenths using non-unit fractions.

Say, "What part of this diagram is shaded?" ($\frac{2}{6}$) Ask a student to write $\frac{2}{6}$ on the chalkboard. Shade in $\frac{3}{6}$ more.

e.g.,



Say, "How many parts did I shade this time? ($\frac{3}{6}$) How many parts are shaded in all?" ($\frac{5}{6}$)

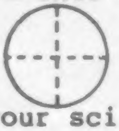
Continue this procedure using other fractions.

4.06.05

4.06.05.01 **add fractions**

STRATEGY 1: Prepare and distribute circles and scissors to each student. Say, "Place one circle on your desk. Fold it into fourths.

e.g.,



Take your scissors and cut the circle into pieces. How many pieces do you have? What do we call each one? ($\frac{1}{4}$) Place one-fourth on your desk. Add another fourth. How many fourths do you have?" (2) Ask a student to write an example on the chalkboard to represent the arrangement.

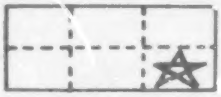
e.g.,

$$\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$$

Continue this procedure using fourths and eighths.

STRATEGY 2: Distribute rectangles divided into six equal parts to each student.

e.g.,



Say, "Shade two of the six equal parts and write the fraction for the shaded part. Draw a star on one of the six equal parts and write the fraction name for that part. What part of the strip is shaded? ($\frac{2}{6}$) What part of the strip has a star? ($\frac{1}{6}$) What part of the whole strip is marked?" ($\frac{3}{6}$) Ask a student to write the addition example to show the representation.

e.g.,

$$\frac{2}{6} + \frac{1}{6} = \frac{3}{6}$$

$$\begin{array}{r} \frac{2}{6} \\ + \frac{1}{6} \\ \hline \frac{3}{6} \end{array}$$

Say, "When we add like fractions, we add the numerators and keep the denominator the same."

Repeat this procedure.

4.06.05

4.06.05.02 subtract fractions

STRATEGY 1: Prepare and distribute fractional parts (fourths and sixths) to each student. Ask the students to place $\frac{4}{4}$ on their desks. Say, "Take away $\frac{1}{4}$. How many fourths are left? (3) What operation did we use?" (subtraction) Write the following examples on the chalkboard.

e.g.,

$$\frac{4}{4} - \frac{1}{4} = \frac{3}{4} \qquad\qquad \begin{array}{r}\frac{4}{4}\\ -\ \frac{1}{4}\\ \hline \frac{3}{4}\end{array}$$

Say, "Are the answers the same? It makes no difference which format we use, our answer is still the same."

Continue this procedure.

STRATEGY 2: Write $\frac{6}{8} - \frac{2}{8}$ on the chalkboard. Say, "When we subtract like fractions, we subtract the numerator and keep the denominator the same." Ask a student to complete the subtraction. Say, "How many eighths are left?" ($\frac{4}{8}$) Write the following on the chalkboard.

e.g.,

$$\begin{array}{r}\frac{6}{8}\\ -\ \frac{2}{8}\\ \hline \end{array}$$

Ask a student to complete the subtraction. Say, "When we subtract like fractions, we subtract the numerator. The denominator remains the same. It does not matter which format we use to write an example. The answer will be the same."

Continue this procedure with other fractions.

4.06.05

4.06.05.03 **add mixed numbers**

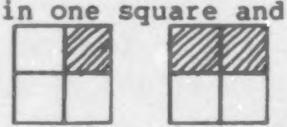
STRATEGY 1: Write the following example on the chalkboard.
e.g.,

$$\begin{array}{r} 1\frac{1}{4} \\ +\ 1\frac{2}{4} \\ \hline \end{array}$$

Say, "When we add mixed numbers, we add the fractions first. How much is $\frac{1}{4} + \frac{2}{4}$? ($\frac{3}{4}$) Next we add the whole numbers. How much is 1 plus 1? (2) We read the sum as two and three-fourths ($2\frac{3}{4}$)."

Continue this procedure using other mixed numbers.

STRATEGY 2: Prepare and distribute four squares to each student. Ask the students to fold two squares into four parts each. Say, "How many parts do we have in each square? (4) What is each part called? ($\frac{1}{4}$) Shade $\frac{1}{4}$ in one square and $\frac{2}{4}$ in the second square.
e.g.,



Place one whole and the square with $\frac{1}{4}$ shaded on your desk. Below this place one whole and the square with $\frac{2}{4}$. Be sure to line up your fraction with your fraction and your whole number with your whole number. Add the fractions. How many fourths are shaded? ($\frac{3}{4}$) How many wholes?" (2) Ask a student to come to the chalkboard and write the addition example that shows this arrangement.
e.g.,

$$\begin{array}{r} 1\frac{1}{4} \\ +\ 1\frac{2}{4} \\ \hline 2\frac{3}{4} \end{array}$$

Continue this procedure using other examples.

302

86

4.06.05

4.06.05.04 **subtract mixed numbers**

STRATEGY 1: Prepare and distribute colored rods to each student. Write $3\frac{3}{4}$ on the chalkboard. Say, "Display three purple rods to represent the whole number and three white rods to represent the fraction." Write the following on the chalkboard.

e.g.,

$$\begin{array}{r} 3\frac{3}{4} \\ \underline{-\ 1\frac{1}{4}} \end{array}$$

Say, "Which part of $1\frac{1}{4}$ is the fraction? ($\frac{1}{4}$) We subtract a fraction from a fraction. Which rods should we remove? (one white rod) What is left? ($\frac{2}{4}$) How many wholes should we subtract? (1) How many wholes are left? (2) What mixed number is left?" ($2\frac{2}{4}$) Write the answer under the example.

Repeat this procedure with other examples.

STRATEGY 2: Write on the chalkboard.

$$\begin{array}{r} 3\ \frac{7}{10} \\ \underline{-1\ \frac{3}{10}} \end{array}$$

Say, "How do we read the first mixed number? (three and seven-tenths) How do we read the second number? (one and three-tenths) We can write these numbers in expanded form." Write the following on the chalkboard.

e.g.,

$$\begin{array}{rcr} 3\frac{7}{10} & = & 3 + \frac{7}{10} \\ \underline{-\ 1\frac{3}{10}} & = & \underline{-\ 1 + \frac{3}{10}} \\ & & 2 + \frac{4}{10} = 2\frac{4}{10} \end{array}$$

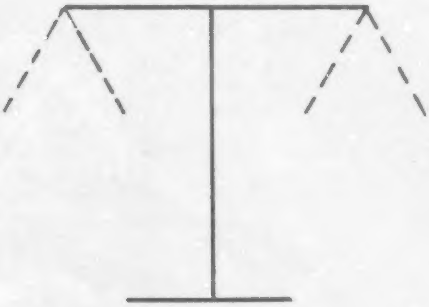
Say, "First we subtract the fractions, and then we subtract the whole numbers." Ask a student to solve the example.

Repeat this procedure.

P.O. 4.06.05.01

NAME:______________________________ CLASS:________ DATE:_______

Balance the scales by matching the two addition examples which have the same answer.



$\frac{1}{6} + \frac{3}{6}$

$\frac{4}{8} + \frac{2}{8}$

$\frac{4}{9} + \frac{3}{9}$

$\frac{3}{10} + \frac{4}{10}$

$\frac{1}{9} + \frac{3}{9}$

$\frac{4}{6} + \frac{1}{6}$

$\frac{5}{10} + \frac{2}{10}$

$\frac{3}{6} + \frac{2}{6}$

$\frac{2}{6} + \frac{2}{6}$

$\frac{2}{9} + \frac{2}{9}$

$\frac{2}{9} + \frac{5}{9}$

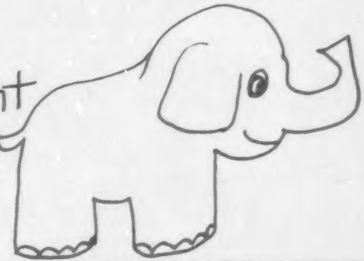
$\frac{5}{8} + \frac{1}{8}$

P.O. 4.06.05.02

NAME: ______________________ CLASS: ________ DATE: ________

Solve.
Use the key to solve the secret message.

What do you get when you cross an elephant with Darth Vader?



a $\frac{11}{15} - \frac{3}{15} = \frac{9}{15}$

b $\frac{10}{15} - \frac{1}{15} =$

c $\begin{array}{r} \frac{6}{12} \\ - \frac{2}{12} \\ \hline \end{array}$

d $\frac{3}{4} - \frac{1}{4} =$

e $\begin{array}{r} \frac{8}{16} \\ - \frac{3}{16} \\ \hline \end{array}$

f $\frac{4}{10} - \frac{1}{10} =$

g $\begin{array}{r} \frac{8}{12} \\ - \frac{4}{12} \\ \hline \end{array}$

h $\begin{array}{r} \frac{20}{25} \\ - \frac{15}{25} \\ \hline \end{array}$

i $\frac{7}{8} - \frac{1}{8} =$

j $\frac{5}{5} - \frac{1}{5} =$

A									
a	e	c	h	g	f	b	j	d	i

Key

A	E	L	N	O	R	T	V
$\frac{9}{15}$	$\frac{4}{12}$	$\frac{5}{25}$	$\frac{5}{16}$	$\frac{2}{4}$	$\frac{6}{8}$	$\frac{4}{5}$	$\frac{3}{10}$

P.O. 4.06.05.03

NAME:____ CLASS:________ DATE:________

Solve the problems. Use the code to find out the secret message.

① $\begin{array}{r} 5\frac{1}{4} \\ +2\frac{1}{4} \\ \hline \end{array}$

② $\begin{array}{r} 3\frac{1}{5} \\ +2\frac{1}{5} \\ \hline \end{array}$

③ $\begin{array}{r} 3\frac{2}{9} \\ +2\frac{2}{9} \\ \hline \end{array}$

④ $\begin{array}{r} 1\frac{1}{5} \\ +4\frac{1}{5} \\ \hline \end{array}$

⑤ $\begin{array}{r} 3\frac{4}{6} \\ +2\frac{1}{6} \\ \hline \end{array}$

⑥ $\begin{array}{r} 4\frac{3}{8} \\ +2\frac{4}{8} \\ \hline \end{array}$

⑦ $\begin{array}{r} 3\frac{4}{12} \\ +4\frac{6}{12} \\ \hline \end{array}$

⑧ $\begin{array}{r} 3\frac{1}{9} \\ +4\frac{3}{9} \\ \hline \end{array}$

⑨ $\begin{array}{r} 5\frac{1}{8} \\ +2\frac{3}{8} \\ \hline \end{array}$

⑩ $\begin{array}{r} 2\frac{3}{6} \\ +5\frac{2}{6} \\ \hline \end{array}$

____ ____   ____ ____ ____ ____   ____ ____ ____ ____

1 2   3 4 5 6   7 8 9 10

$5\frac{5}{6}$	$5\frac{4}{9}$	$7\frac{10}{12}$	$7\frac{2}{4}$	$7\frac{4}{9}$	$6\frac{7}{8}$	$7\frac{5}{6}$	$5\frac{2}{5}$	$7\frac{4}{8}$
U	Y	B	D	E	R	T	O	S

P.O. 04.06.05.02

NAME:____CLASS:__________DATE:________

Find the difference.

$9\frac{6}{7}$ $-\ 2\frac{1}{7}$ $7\frac{5}{7}$	$8\frac{7}{8}$ $-\ 2\frac{3}{8}$	$5\frac{9}{10}$ $-\ 1\frac{3}{10}$
$8\frac{11}{12}$ $-\ 5\frac{5}{12}$	$7\frac{8}{9}$ $-\ 5\frac{2}{9}$	$9\frac{5}{8}$ $-\ 2\frac{1}{8}$
$8\frac{9}{10}$ $-\ 4\frac{1}{10}$	$9\frac{3}{4}$ $-\ 1\frac{1}{4}$	$5\frac{9}{12}$ $-\ 2\frac{7}{12}$

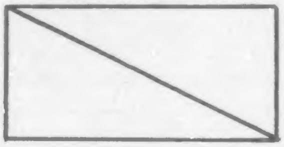
4.09.05 DIAGONALS OF A POLYGON

(1-2 lessons)

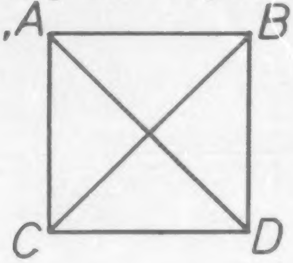
PERFORMANCE OBJECTIVES

The student will be able to...

4.09.05.01B define a diagonal as a line segment joining any two nonconsecutive vertices; e.g.,



4.09.05.02B identify the diagonals of a polygon. e.g.,



$\overline{AD}$ and $\overline{BC}$ are diagonals.

4.09.05

VOCABULARY

TERMS

line segment
polygon
diagonal
vertex
vertices

GETTING STARTED

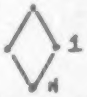
Distribute geoboards to groups of students. Say, "Join any two points with a rubber band. What did we make on our geoboard? (line segment) A line that has two end points is called a line segment."
e.g., .____.
Make a triangle using this line segment as one of its sides.
e.g.,

Say, "A triangle is a polygon. Any closed figure with three or more line segments is called a polygon." Ask students to construct other polygons on the geoboard.

Prepare and distribute rulers to each student. Say, "We will draw a model of a baseball diamond. Make a point on your paper to show homeplate. Make another point above and to the right to show first base. e.g., . Say, "A player started at home plate and ran to first base." Place an H at home plate and a one at first base.

.1
e.g., .   Say, "How can we show that the player ran from home plate
H
to first base?" (Draw a line to join both points, e.g., $\overset{1}{\underset{H}{/}}$)

Say, "We call this a line segment. Let's draw three more line segments until we have made a baseball diamond."
e.g.,



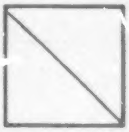
Say, "We constructed a closed figure. It is a polygon. A polygon is any closed figure with three or more line segments. The points at which the line segments meet or intersect are called vertices."

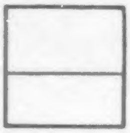
4.09.05

4.09.05.01 **define a diagonal as a line segment joining any two nonconsecutive vertices**

STRATEGY 1: Draw the following illustrations on the chalkboard.

e.g.,

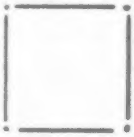




Ask students to point to the vertices of each polygon. Say, "Let's look at picture #1. What do you notice about the line segment inside the polygon? (It begins at a vertex and ends at a vertex.) We call this line segment a diagonal." Point to picture #2. Say, "The line segment inside this polygon is not a diagonal because it does not touch two nonconsecutive vertices."

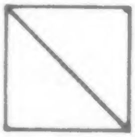
STRATEGY 2: Distribute geoboards to groups of students. Say, "Construct four line segments to form a polygon. Let's pretend that it is a map of the park in our neighborhood."

e.g.,



Say, "Find one vertex and place a rubber band on it. We would like to visit another point in the park. Extend the rubber band, skip a vertex and attach it to the next vertex."

e.g.,

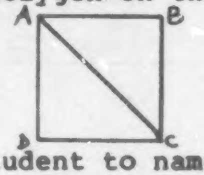


Say, "We call this line segment a diagonal. A diagonal is any line segment that joins two nonconsecutive points."

4.09.05

4.09.05.02 **identify the diagonals of a polygon**

STRATEGY 1: Draw a polygon on the chalkboard.
e.g.,



Ask a student to name each side. Say, "What is the name for the line segment that has end points at two nonconsecutive vertices?" (diagonal) Ask a student to come to the chalkboard and construct a diagonal. Say, "What is the name of the diagonal?" (AC) Repeat this procedure using other polygons.

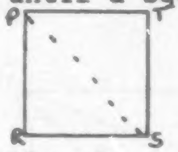
STRATEGY 2: Say, "In the gym Alex is running from one side to another. Let's name the point at which he started, Point P, and the point to which he ran, Point R."
e.g.,

.P

.R

Say, "Join the two points, e.g., . What is the name of the line segment we just contructed? (PR) Alex made a right turn. Draw this line segment and label the new point S, e.g., What is the name of this line segment?" (RS) Repeat this procedure until a square is formed.

e.g.,



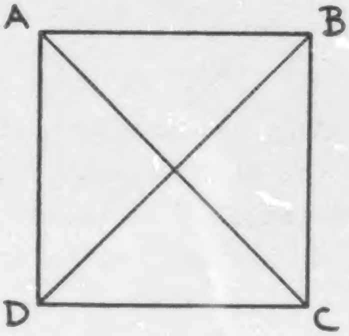
Say, "Now Alex is running from one corner to another. What is another word for corner? (vertex) What is the name of the line segment that has two nonconsecutive vertices as end points?" (diagonal) Draw the diagonal on the chalkboard. Say, "What is the name of the diagonal in this polygon?" (PS)

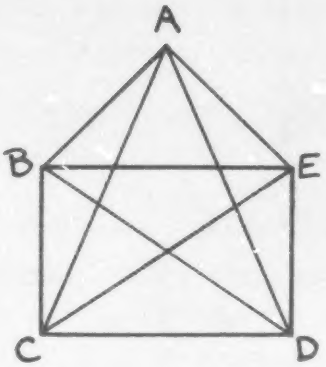
Continue this procedure.

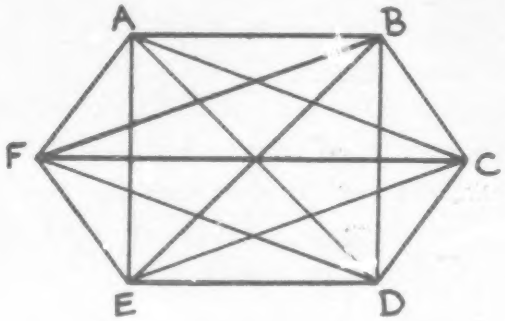
P.O. 4.09.05 01-02

NAME: ______________________________ CLASS: __________ DATE: ________

How many diagonals in each figure?
Name the diagonals.







Unit 37

4.09.06 PARALLELOGRAMS

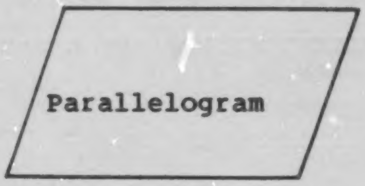
(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to..

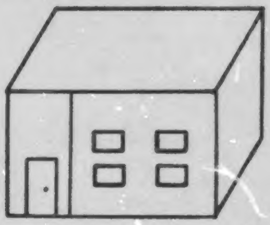
4.09.06.01B define a parallelogram as a quadrilateral in which the opposite sides are parallel;

e.g.,



4.09.06.02B identify parallelograms in the environment.

e.g.,



4.09.06

VOCABULARY

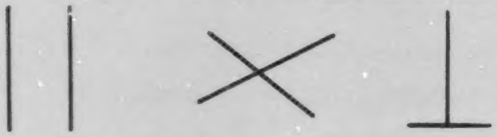
TERMS

quadrilateral
parallelogram

GETTING STARTED

Draw various lines on the chalkboard.

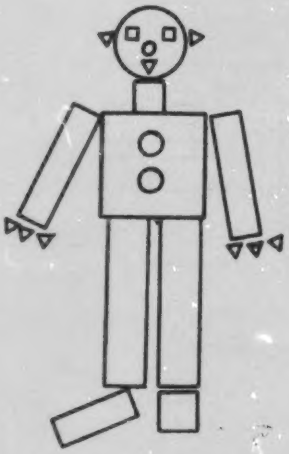
e.g.,



Ask the students to identify these lines. (parallel, intersecting and perpendicular) Say, "Can you find examples of these lines in the classroom?" (sides of a desk, the wall meeting the floor)

Prepare and distribute paper and crayons to each student. Say, "We are going to use different shapes and lines to draw a shape person." Ask the students to draw the person and color their drawing in the following way: triangle-red, square-blue, circle-yellow, rectangle-green. Draw the picture on the chalkboard.

e.g.,



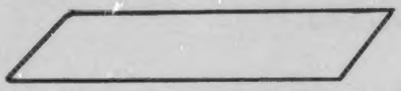
4.09.06

4.09.06.01 **define a parallelogram as a quadrilateral in which the opposite sides are parallel**

STRATEGY 1: Prepare and distribute straws and pipe cleaners to each student. Say, "Take two long straws and place them on your desk so that they represent parallel lines.
e.g.,

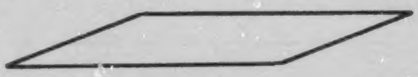
Now place two short straws vertically so that they are parallel.
e.g.,

Attach the straws with your pipe cleaners to form a four sided figure.
e.g.,



Four sided figures are called quadrilaterals. The figure we made is called a parallelogram. A parallelogram is a quadrilateral whose sides are parallel to each other."

STRATEGY 2: Distribute geoboards to groups of students. Ask students to contruct two parallel lines. Say, "Parallel lines have equal distance between them. They will never meet. Construct a figure that has four sides using two sets of parallel lines.
e.g.,



We call a four sided figure a quadrilateral." Ask a student to show his figure to the class. Point to the parallel sides. Say, "When opposite sides are parallel in a quadrilateral, we call the figure a parallelogram."

4.09.06

4.09.06.02 identify parallelograms in the environment

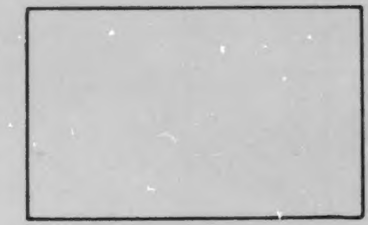
STRATEGY 1: Open the door to the classroom. Say, "The door is an example of a parallelogram. It is a parallelogram because the opposite sides are parallel." Ask students to find other figures in the room that are parallelgrams, e.g., desk, chalkboard...

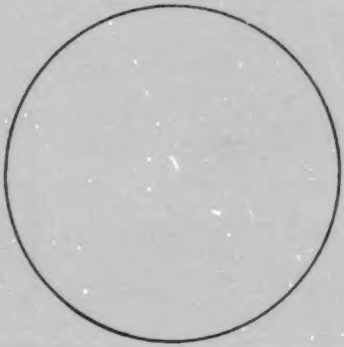
STRATEGY 2: Say, "Let's play a game. The student who names the greatest number of parellelograms is the winner. Think of the places you pass on your way to school, things in the classroom and things at home." Elicit answers from the students, e.g., our building, its windows, a bus, a train. Ask a student to illustrate one of these at the chalkboard.

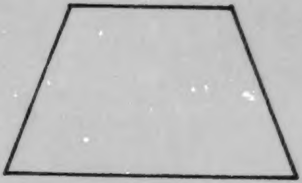
P.O. 4.09.06.01

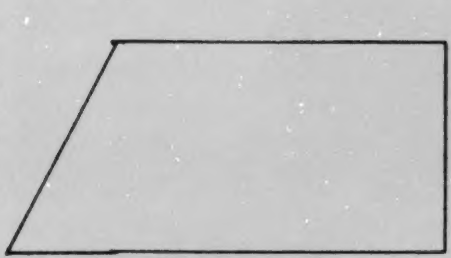
NAME: ______________________________ CLASS: ________ DATE: ________

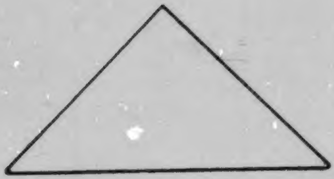
Color all the parallelograms.

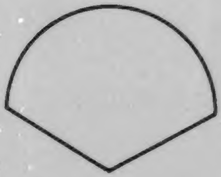


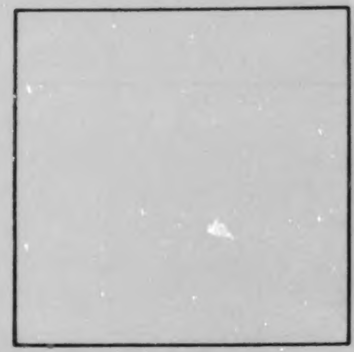


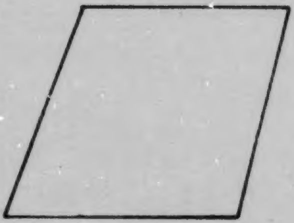


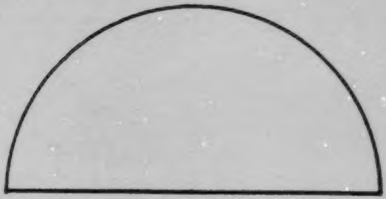










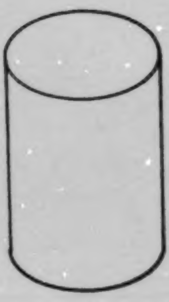


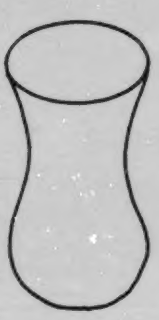
P.O. 4.09.06.02

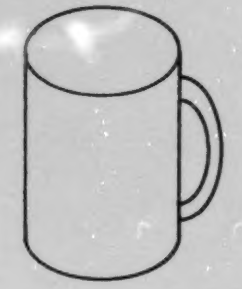
NAME: ______________________ CLASS: __________ DATE: ________

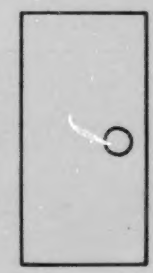
1. Circle the parallelogram.
2. How many parallelograms do you see in this figure?
3. How many parallelograms do you see in this picture?

Circle the parallelograms.



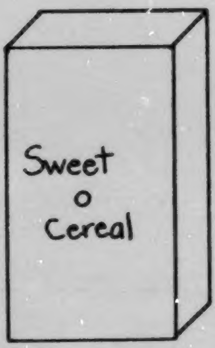






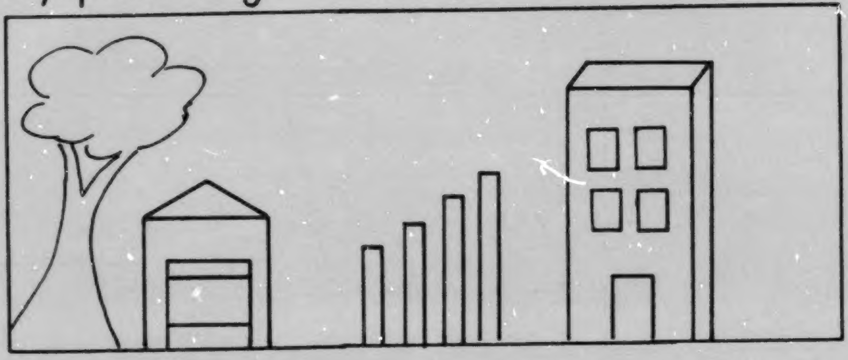
____

How many parallelograms do you see in this figure?



____

How many parallelograms do you see in this picture?



____

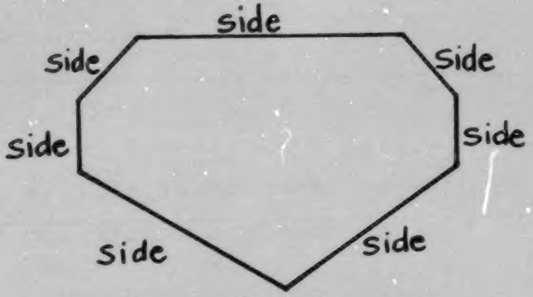
4.10.04 PERIMETERS

(1 lesson)

PERFORMANCE OBJECTIVES

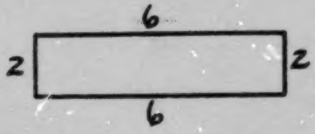
The student will be able to...

4.10.04.01A identify perimeter as the total distance around the sides of an object;
e.g.,


side
side
side
side
side
side
side

side + side + side + side + side + side + side

4.10.04.02A develop and use a formula to find perimeter.
e.g.,



$p = l + l + w + w$

$l = 6''$ $w = 2''$

$p = 6'' + 6'' + 2'' + 2''$

$p = 16''$

4.10.04

VOCABULARY

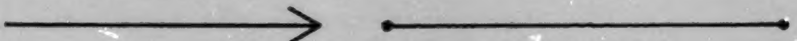
TERMS

perimeter

GETTING STARTED

Prepare a centimeter ruler. Draw rays and line segments of various lengths on the chalkboard.

e.g.,



Ask the students to identify the rays and line segments. Ask students to come to the chalkboard and measure the drawings.

Prepare and distribute centimeter rulers to each student. Ask the students to draw a line segment that is 10 cm long. Say, "Now draw three more segments the same length and make a shape.

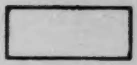
e.g.,

What shape did you make? (square) Now draw a horizontal line segment that is 10 cm long and a vertical segment that is 6 cm long.

e.g.,

Draw two segments parallel to the segments you just drew.

e.g.,



What shape did you make?" (rectangle)

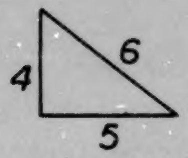
Repeat this procedure using other line segments.

4.10.04

4.10.04.01 define perimeter as the total distance around the sides of an object

STRATEGY 1: Prepare and distribute oak tag polygons of various sizes and rulers to groups of students. Say, "Use your rulers to measure the length of the sides of each figure and record the name of the shape and its length. The total distance around an object is called perimeter. In order to determine the perimeter of a figure, we add the lengths of each side."

e.g.



perimeter = 4 + 6 + 5
= 15

Ask the students to exchange shapes and find the perimeter of this shape.

STRATEGY 2: Prepare and distribute geoboards, rubber bands and dot paper to each student. Say, "Make the smallest square you can on your geoboard. The length of each side of this square is one unit long. To find the total distance around the square we add the length of each side." Ask a student to add all of the sides. Say, "The total distance around the sides of an object is called the perimeter." Ask the students to make various squares on the geoboard and find the perimeter.

4.10.04

4.10.04.02 develop and use the formula to find perimeter

STRATEGY 1: Prepare and distribute graph paper to each student. Say, "Draw a rectangle on the paper and determine its perimeter." Ask several students to describe the rectangle they drew by giving its length, width and perimeter. Record the measurements on the chalkboard.

e.g.,

Length	Width	Perimeter
5 units	2 units	14 units
8	3	22

Say, "We can determine the perimeter of any rectangle by simply adding length plus length plus width plus width." Write perimeter = l + l + w + w on the chalkboard. Point to the formula and say, "We call this the formula to find perimeter."

STRATEGY 2: Divide the class into groups. Ask each group to use a ruler to measure various rectangular objects in the classroom, e.g., bulletin board. Say, "We want to find the perimeter of these objects." Draw a table on the chalkboard and ask each group to record its findings.

e.g.,

object	length	width	perimeter
bulletin board	4'	3'	14'

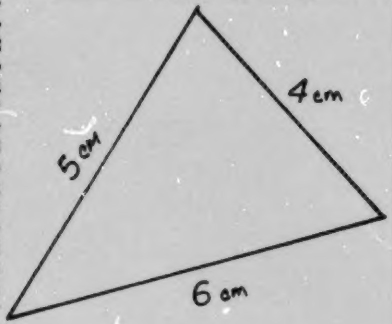
Ask the students to look for relationships among the numbers. Say, "If we know the length and width of an object we can determine its perimeter by adding the length twice and the width twice." Write p = l + l + w + w on the chalkboard. Say, "This is the formula we use to find perimeter."

Repeat this procedure with other classroom objects.

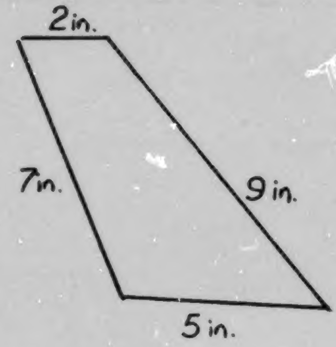
P.O. 4.10.04.01

NAME: ______________________ CLASS: __________ DATE: ______

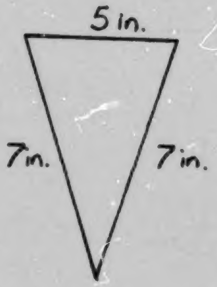
Find the perimeter of each figure.
Label your answer with the correct unit of measurement.



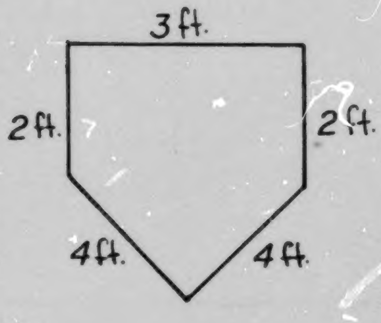
P = 5 + 4 + 6 = 15 cm


2 in.
7 in.
9 in.
5 in.

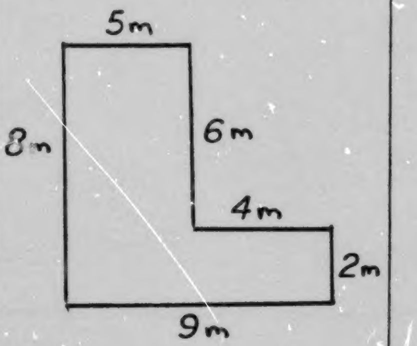
P = ____________



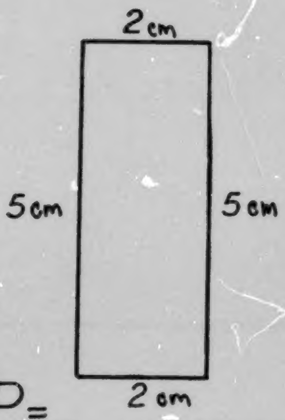
P = ____________


3 ft.
2 ft.
2 ft.
4 ft.
4 ft.

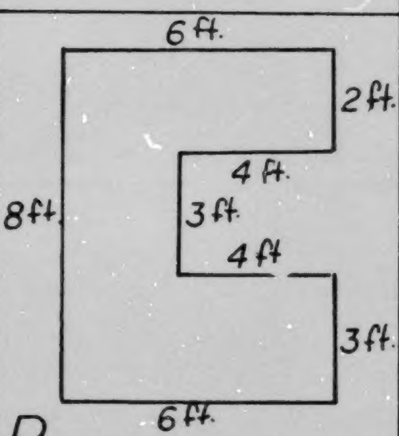
P = ____________


5 m
8 m
6 m
4 m
2 m
9 m

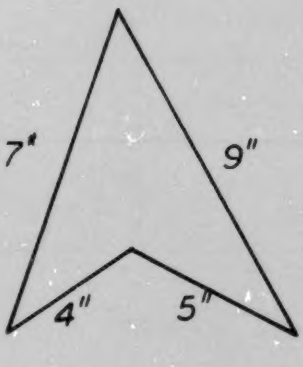
P = ____________


2 cm
5 cm
5 cm
2 cm

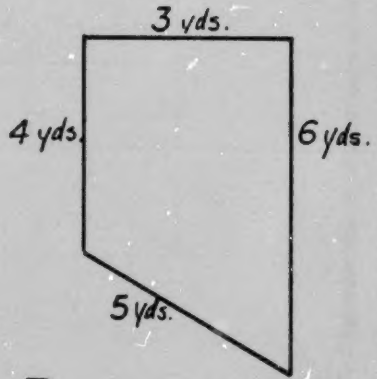
P = ____________


6 ft.
2 ft.
4 ft.
8 ft.
3 ft.
4 ft
3 ft.
6 ft.

P = ____________



P = ____________


3 yds.
4 yds.
6 yds.
5 yds.

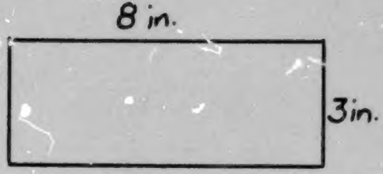
P = ____________

413

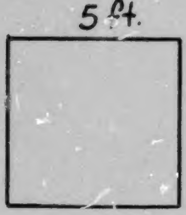
P.O. 4.10.04.02

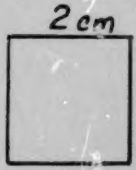
NAME:____________________ CLASS:________ DATE:________

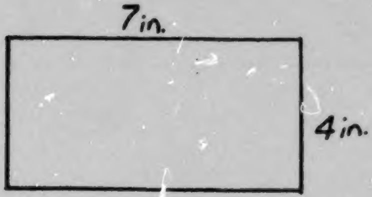
Use the formula to find the perimeter.

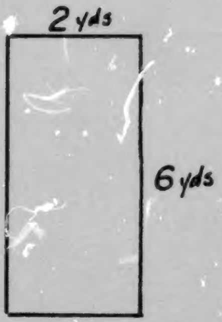


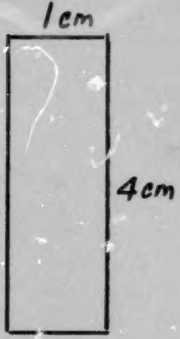
$P = (8 + 3) \times 2$
$= 22$ in.











Length of rectangle	3 cm	5 in.	4 in.	6 ft.	4 cm	5 m	8 yds.
width of rectangle	2 cm	3 in.	1 in.	3 ft.	2 cm	1 m	2 yds.
Perimeter	12 cm						

Unit 39

4.05.04 DIVISION OF MONEY VALUES

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.05.04.01B divide values to \$.99 by a 1-digit divisor;
e.g.,

$$\begin{array}{r} \$.12 \\ 6\overline{)\$.72} \end{array}$$

4.05.04.02B divide values to \$9.99 by a 1-digit divisor;
e.g.,

$$\begin{array}{r} \$3.33 \\ 3\overline{)\$9.99} \end{array}$$

4.05.04.03B round values to the nearest dollar;
e.g.,

\$3.25 rounds to \$3.00
\$2.98 rounds to \$3.00

4.05.04.04B round to the nearest dollar to estimate quotients;
e.g.,

$$3\overline{)\$5.85} \text{ rounds to } \begin{array}{r} \$2.00 \\ 3\overline{)\$6.00} \end{array} \text{ estimated quotient}$$

4.05.04.05B solve word problems related to skills learned in this module.

e.g.,

Three boxes of stationery sell for $9.99. How much does one box cost?

```
   $3.33
3)$9.99
  -9 00
     99
    -90
      9
     -9
      0
```

One box of stationary sells for $3.33.

4.05.04

VOCABULARY

TERMS	SYMBOLS
quotient	
divisor	
dividend	
decimal point	.
dollar sign	$

GETTING STARTED

Prepare flash cards with division facts through 81 ÷ 9. Divide the class into two teams. Say, "We will play 'Division Baseball'. Team A is up first. I will show you a card. If you get the answer right, you go to the first base. If you get it wrong, your team has an out. Three outs and Team B has a chance." For every right answer the players move ahead a base. When player 1 reaches home, the team gets a point. Play ends at the end of nine innings.

Write the following exercise on the chalkboard.

I. Round the following numbers to the nearest ten.

1) 28 ____ 2) 31 ____ 3) 49 ____
4) 52 ____ 5) 85 ____

II. Round the following numbers to the nearest hundred.

1) 621 ____ 2) 543 ____ 3) 475 ____
4) 894 ____ 5) 713 ____ 6) 409 ____
7) 256 ____ 8) 322 ____ 9) 679 ____
10) 856 ____

4.05.04

4.05.04.01 divide values to \$.99 by a 1-digit divisor

STRATEGY 1: Prepare play money in various denominations of coins. Display 96¢ as nine dimes and six pennies. Ask a student to come to the front of the classroom and divide the money into three equal groups. Say, "How many dimes are in each group? (3) How many pennies? (2) How much money is in each group?" (32¢) Write $3\overline{)\$.96}$ on the chalkboard. Ask a student to complete the example.

e.g.,

$$\begin{array}{r} \underline{\$.32} \\ 3\overline{)\$.96} \end{array}$$

Say, "When we divide money, we divide as we always do. The only difference is that we put a decimal point and a dollar sign in the answer."

STRATEGY 2: Write two examples on the chalkboard.

(1) $6\overline{)72}$ (2) $6\overline{)\$.72}$

Ask a student to do the first example at the chalkboard. Say, "What is the difference between example 1 and example 2? (Example 2 has a dollar sign and a decimal point.) We divide money as we divide whole numbers. However, we must remember to place a decimal point and dollar sign in the answer."

e.g.,

$$\begin{array}{r} \underline{\$.12} \\ 6\overline{)\$.72} \\ \underline{-\ 60} \\ 12 \\ \underline{-12} \\ 0 \end{array}$$

4.05.04

4.05.04.02 divide values to $9.99 by a 1-digit divisor

STRATEGY 1: Place these two examples on the chalkboard.

(1) $2\overline{)486}$ (2) $2\overline{)\$4.86}$

Ask a student to work the first example at the chalkboard.

e.g.,

```
   243
 2)486
  -400
    80
  - 80
     6
   - 6
     0
```

Say, "What is the difference between example 1 and example 2? (Example 2 is money.) Can you figure out how to find the quotient for example 2?" (Perform the division and place a decimal point and a dollar sign in the quotient.) Repeat this procedure using other numbers.

STRATEGY 2: Say, "Four rolls of film cost $4.84. I want to buy one roll of film. What will it cost?" Ask a student to write the division on the chalkboard.

e.g.,

$4\overline{)\$4.84}$

Say, "First we divide the four dollars, then the eight dimes, and finally, the four pennies. Dividing money is just like any other division example. We must remember to include the dollar sign and decimal point in the quotient." Ask a student to complete the division.

e.g.,

```
   $1.21
 4)$4.84
   -4.00
      84
      80
       4
       4
       0
```

4.05.04

4.05.04.03 **round values to the nearest dollar**

STRATEGY 1: Write the following numbers on the chalkboard.

325   298   459

Say, "When we round numbers to the nearest hundred, we must look at the digit in the tens column. If the digit in the tens column is five or more, then we round the hundred to the next higher number. If the digit in the tens column is less than five, then we do not change the digit in the hundreds place." Ask the students to round the numbers written on the chalkboard.

Write these amounts on the chalkboard.

$3.25 $2.98 $4.59

Say, "When rounding money to the nearest dollar, we look at the digit after the decimal point, the digit that represents dimes. If the digit after the decimal point is five or more, we round to the next higher dollar amount. We do not change the dollar amount if the digit after the decimal point is less than five."

Ask the students to round the amounts written on the chalkboard to the nearest dollar.

STRATEGY 2: Write the following amounts on the chalkboard. e.g.,

$3.15 $4.75 $2.87 $5.29

Ask a student to read the first amount. Say, "What does the digit to the left of the decimal point represent? (dollars) What do the digits to the right of the decimal point represent? (cents) When rounding numbers to the nearest dollar, we look at the number of cents in each amount. We round down if the number of cents is less than 50 cents. We round up if the number of cents is equal to or

STRATEGY 2: cont'd greater than 50 cents. Look at \$3.15. How many cents? (15) Is fifteen more or less than 50? (less) Do we round up or down? (down) To what does \$3.15 round?" (\$3.00)

Continue this procedure for the other amounts.

4.05.04.04 round to the nearest dollar to estimate quotients

STRATEGY 1: Say, "Three toys cost \$5.85. About how much would one toy cost? What is \$5.85 rounded to the nearest dollar? (\$6.00) Divide \$6 by three. What is the answer? (\$2.00) Therefore, each toy costs about \$2.00."

Write the example on the chalkboard.

e.g.,

$$3\overline{)\$5.85}\quad \text{rounds to}\quad \begin{array}{r}\$2.00\\ 3\overline{)\$6.00}\\ \underline{-6.00}\\ 0\end{array}\quad \begin{array}{l}\text{estimated}\\ \text{quotient}\end{array}$$

Repeat this procedure using other amounts.

STRATEGY 2: Say, "To estimate a quotient when dividing money, we round the dividend to the nearest dollar. Then we divide. The quotient becomes our estimated answer." Write an example on the chalkboard and ask a student to round the dividend, rewrite the example and solve.

e.g.,

$3\overline{)\$5.89}$

round \$5.89 to nearest dollar ——> \$6.00

divide by the divisor ——> $3\overline{)\$6.00}$

estimated quotient is \$2.00

Repeat the procedure using other examples.

4.05.04

4.05.04.05 solve word problems related to skills learned in this module

STRATEGY 1: Write a word problem on the chalkboard.
e.g.,

> Two checker sets cost \$5.99. About how much would one set cost?

Ask the students to choose the correct operation to solve the problem. Say, "We want to find about how much something costs. We want to estimate." Ask a student to estimate and solve the problem.
e.g.,

$$\$5.99 \longrightarrow \$6.00 \qquad \begin{array}{r} \$3.00 \\ 2\overline{)\$6.00} \end{array} \qquad \begin{array}{r} \$2.99 \\ 2\overline{)\$5.99} \\ \underline{4.00} \\ 1.9 \\ -\underline{1.8} \\ 19 \\ -\underline{18} \\ 1 \end{array}$$

Repeat this procedure using other problems.

STRATEGY 2: Collect supermarket ads from Sunday's newspapers. Use the ads to find the cost of one item when the cost of many is given.
e.g.,

5 lemons for \$1.00
1 lemon costs \$.20

Ask students to make up and solve their own word problems using the ads.

P.O. 4.05.04.01

NAME:______________________________ CLASS:__________ DATE:________

Find the quotients.

$$\begin{array}{r}\$.11\\ 3\overline{)\$.33}\end{array}$$

$5\overline{)\$.75}$ $4\overline{)\$16}$ $6\overline{)\$.96}$

$4\overline{)\$.28}$ $8\overline{)\$.88}$ $6\overline{)\$.12}$

$2\overline{)\$.30}$ $7\overline{)\$.49}$ $9\overline{)\$.99}$

$8\overline{)\$56}$

P.O. 4.05.04.02

NAME: ______________________ CLASS: __________ DATE: ________

Divide.

$3\overline{)\$9.99}$ $7\overline{)\$9.70}$ $4\overline{)\$8.84}$

$8\overline{)\$6.40}$ $5\overline{)\$9.00}$ $9\overline{)\$9.18}$

$6\overline{)\$1.86}$ $2\overline{)\$7.64}$

P.O. 4.05.04.03

NAME: ______________________ CLASS: ________ DATE: ______

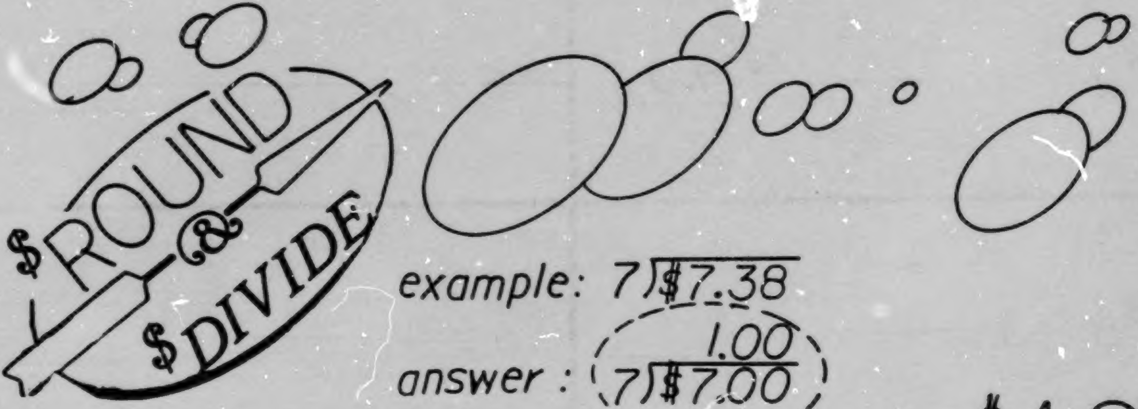
Round each value to the nearest dollar.

$3.96 → $4.00	$6.76 → ______
$8.93 → ______	$8.54 → ______
$5.49 → ______	$268 → ______
$1.62 → ______	$6.96 → ______
$3.80 → ______	$8.80 → ______
$2.46 → ______	$4.02 → ______

P.O. 4.05.04.04

NAME: ______________________________ **CLASS:** __________ **DATE:** ________

Round the dividend to the nearest dollar.
Divide.
Match the quotient.



example: $7\overline{)\$7.38}$

answer: $\begin{array}{r} 1.00 \\ 7\overline{)\$7.00} \end{array}$

$3\overline{)\$8.93}$

$2\overline{)\$9.87}$

$2\overline{)\$7.53}$

$5\overline{)\$9.86}$

$1\overline{)\$5.98}$

\$4.00

\$1.00

\$2.00

\$3.00

\$6.00

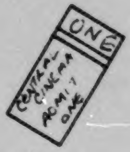
\$5.00

P.O. 4.05.04.05

NAME:______________________ CLASS:__________ DATE:________

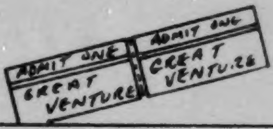
Solve.

1. Movie tickets cost $6.42 for three people. About how much will one ticket cost?


ONE
CENTRAL CINEMA
ADMIT ONE

2. Jerry wants to buy a new checker set. The cost for two of them is $8.38. What is the cost of one set?

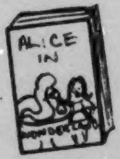
3. The admissiin to an amusement park is $4.84 for a family of 4. How much will one ticket cost?


ADMIT ONE
GREAT VENTURE
ADMIT ONE
GREAT VENTURE

4. The sale price for three model airplanes is $6.42. About how much will one model airplane cost?

5. James bought 3 ballons for $2.70. He will sell one ballon to his friend Sam. About how much will one ballon cost Sam?

6. Four books were on sale for $8.94. What is the price of one book?


ALICE IN
WONDERLAND

4.01.05 ROMAN SYSTEM TO SYMBOL C

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.01.05.01C identify the Roman symbols L and C and use them with the symbols I,V, and X to write Roman numerals;

e.g.,

L = 50   LV = 55   CLXI = 161

C = 100   CIV = 104

4.01.05.02C rename a Roman numeral as its Arabic equivalent;

e.g.,

XL = 40

CCLXV = 265

4.01.05.03C rename an Arabic number as its Roman equivalent.

e.g.,

78 = LXXVIII

365 = CCCLXV

122

4.01.05

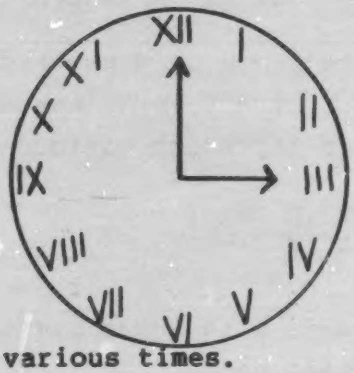
VOCABULARY

TERMS	SYMBOLS
fifty	C
one hundred	L
Roman numerals	

GETTING STARTED

Draw a clock face on the chalkboard using Roman numerals to show the hours. Place the minute hand on XII and the hour hand on III. Ask a student to tell what time it is.

e.g.,



Repeat this for various times.

Prepare two sets of cards. Write the numbers from 1-39 on one set and the same numbers as Roman numerals on the second set. Arrange ten cards from each set face down on a desk in two rows. Say, "We are going to play 'Concentration'. The object of the game is to make a match. If the two cards you choose are a match, you go again. If they do not match, replace the cards in the correct row and another student will have a chance."

Continue play until all of the cards have been matched.

4.01.05

4.01.05.01 **identify the Roman symbols L and C and use them with the symbols I, V, and X to write Roman numerals**

STRATEGY 1: Prepare and distribute eleven pieces of oak tag to each student. Say, "We are going to make Roman numeral cards. Write I on three cards, V on one card, X on three cards, L on one card and C on three cards. What does I equal? (1) ...V? (5) ...X? (10) L equals 50 and C equals 100."

Say, "When I is before V or X subtract I. When X is before L or C subtract 10." Ask the students to use their cards to represent various numerals.
e.g.,
126 = C X X V I
41 = X L I

STRATEGY 2: Prepare eleven cards with Roman symbols written on each card. You will need three I, one V, three X, one L and three C cards. Ask the students to identify the cards with the following symbols, I, V and X. Display the L and C cards. Say, "L equals fifty and C equals one hundred."

Write a number on the chalkboard, e.g., 213. Ask a student to find the cards to show this number.
e.g.,
C C X I I I
Continue this procedure using other numbers.

4.01.05.02 **rename a Roman numeral as its Arabic equivalent**

STRATEGY 1: Prepare thirty cards with Roman numerals written on them. Ask a student to pick a card from the box

STRATEGY 1: cont'd

and rename it as its Arabic equivalent. Say, "Please write both the Roman numeral and its Arabic equivalent on the chalkboard."

e.g.,

CCXXIV 224

Continue this procedure using the remaining cards.

STRATEGY 2: Write a list of forty Roman numerals from 1 through 389, in random order, on the chalkboard. Ask the students to come the chalkboard and rewrite the numbers in ascending order. Ask other students to write the Arabic equivalents on the chalkboard.

4.01.05.03 rename an Arabic number as its Roman equivalent

STRATEGY 1: Write the following numbers on the chalkboard.

e.g.,

6, 11, 51, 101

Ask students to come to the chalkboard and rename the numbers as their Roman equivalents.

e.g.,

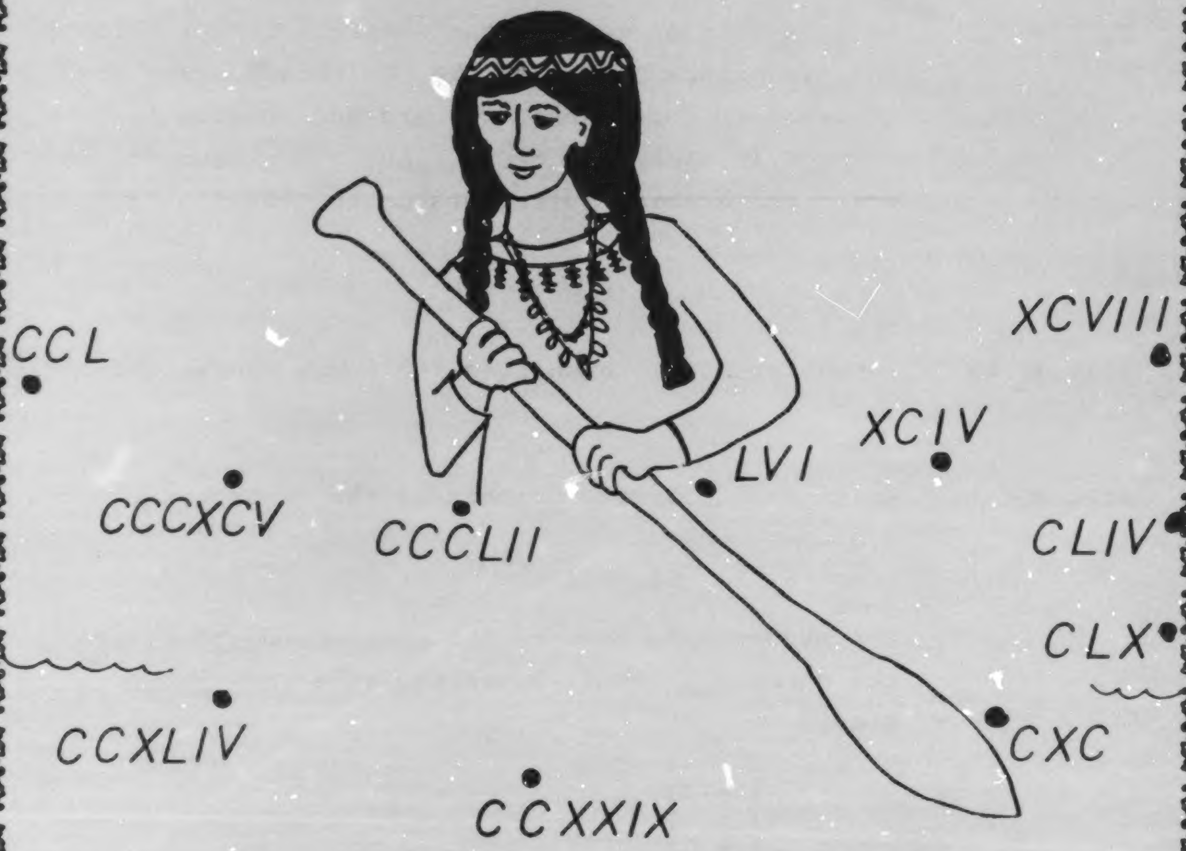
6 = VI
11 = XI
51 = LI
101 = CI

STRATEGY 2: Adapt Strategy 1 used in P.O. 4.01.06.02.

P.O. 4.01.05.01

NAME:_______________________________CLASS:________DATE:______

Connect the dots by going from the smallest to the largest Roman numeral.


CCL
XCVIII
XCIV
LVI
CCCXCV
CCCLII
CLIV
CLX
CCXLIV
CXC
CCXXIX

P.O. 4.01.05.02

NAME: ______________________ CLASS: __________ DATE: ________

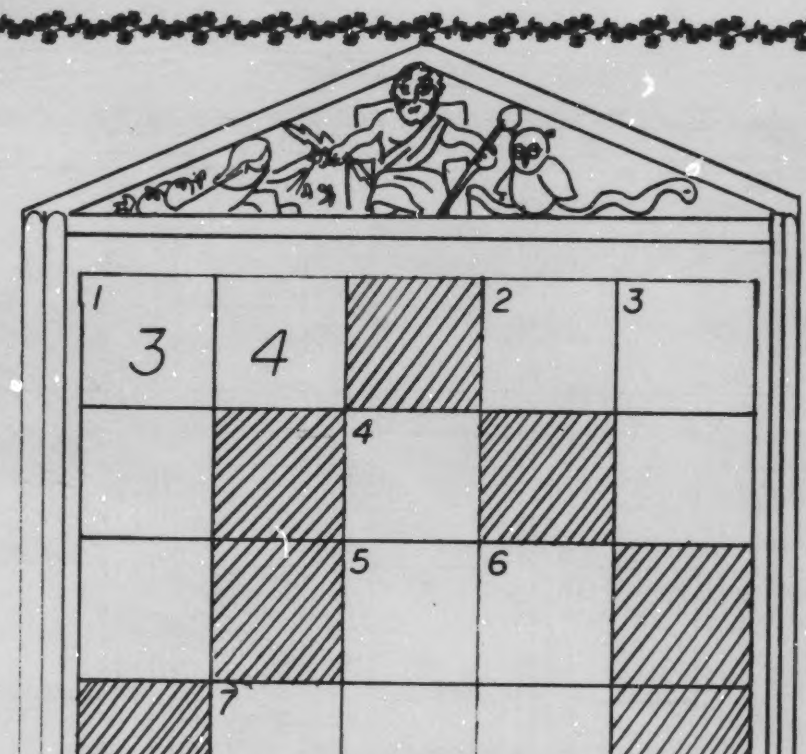
Rename Roman Numerals as Arabic Numerals.
Complete the cross number puzzle.

Across

1 XXXIV
2 LV
5 XXIX
7 CCCLXVIII
8 L
10 LXXXVII
12 IV
13 CCXCII
15 XC

Down

1 CCCIII
3 LI
4 CCXXVI
7 CCCVIII
9 CXCII
11 LXXII
12 XLIX
14 XCIX

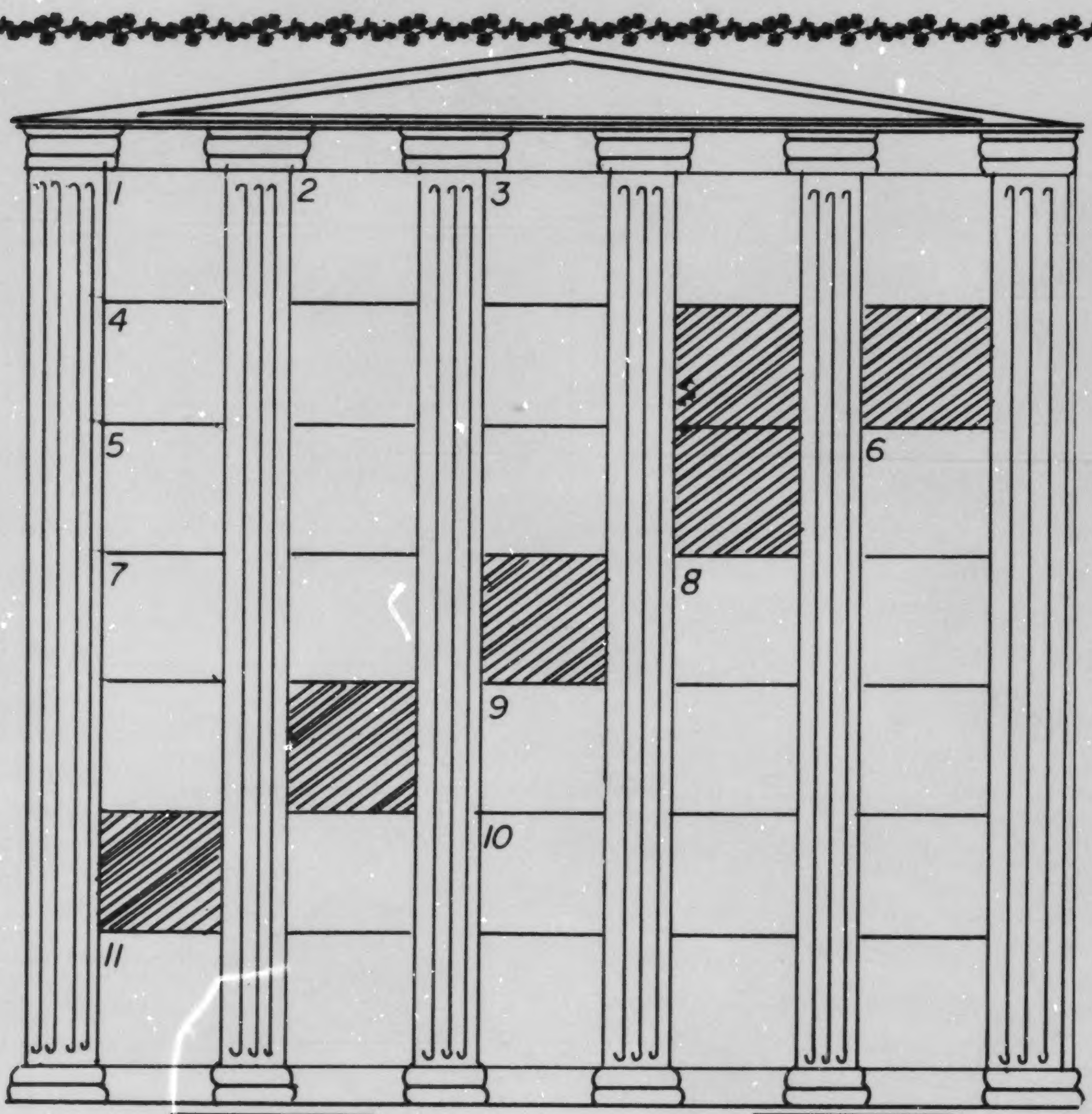


1 3	4	▨	2	3
	▨	4	▨	
	▨	5	6	▨
▨	7			▨
8		▨	▨	9
▨	10	11	▨	
12	▨	13	14	
15		▨		▨

P.O. 4.01.05.03

NAME:______________________________CLASS:________DATE:_______

Rename the Arabic numerals as Roman numerals. Use the Roman numerals to complete the puzzle.



Across

1	315
4	91
5	210
7	6
8	110
9	70
10	91
11	214

Down

1	196
2	301
3	109
6	74
8	191
9	70

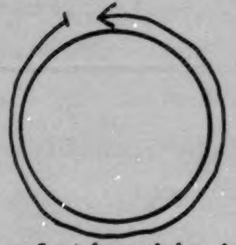
4.10.05 CIRCUMFERENCE

(1-2 lessons)

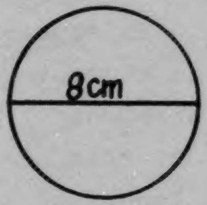
PERFORMANCE OBJECTIVES

The student will be able to...

4.10.05.01B define circumference as the distance around a circle;
e.g.,

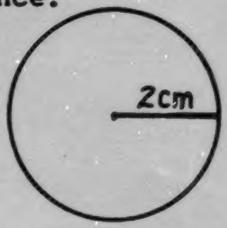


4.10.05.02B find the relationship between diameter and circumference;
e.g.,



The circumference is approximately three times the diameter.

4.10.05.03B find the relationship between radius and circumference.
e.g.,



The circumference is approximately 12 cm.

4.10.05

VOCABULARY

TERMS

circumference
diameter
radius

GETTING STARTED

Prepare and distribute blank paper, scissors and a cardboard circle to each student. Say, "Trace the circle and cut it out. Fold your paper circle in half, and open it. What do we call the line going across the circle? (diameter) Fold your circle in half, and fold it in half again. Open your circle. What do we call each of these lines?" (a radius)

Continue this procedure identifying diameters and radii in circular objects in the environment.

Prepare and distribute scissors, string and centimeter rulers to each student. Ask the students to estimate the distance in centimeters around the sides of a textbook. Say, "Place a piece of string around the sides of a textbook. Cut off that length of string. Measure the length of string with your centimeter ruler. We have measured the perimeter of the textbook."

Repeat this procedure using other polygons in the environment.

4.10.05

4.10.05.01 **define circumference as the distance around a circle**

STRATEGY 1: Say, "What is the shape of the rim of the wastepaper basket? (circle) The distance around a circle is called its circumference."

Repeat the procedure with other circular objects.

STRATEGY 2: Say, "What did we call the distance around a rectangle or square? (perimeter) We call the distance around a circle its circumference." Ask the students to find circles in the classroom and trace the circumference with their fingers.

4.10.05.02 **find the relationship between diameter and circumference**

STRATEGY 1: Prepare and distribute a paper circle, string and scissors to each student. Ask the students to form a diameter by folding the paper circle. Say, "Stretch a piece of string across the diameter. Cut the string. Stretch a piece of string around the edge of the paper circle. Cut the string." Ask the students to compare the two lengths of string. Say, "What do you notice about the two lengths? How much bigger is the circumference than the diameter?" (about three times bigger)

Repeat this procedure using other circular objects.

STRATEGY 2: Prepare string and cylindrical objects. Wrap a string around a cylindrical object. Cut off the string so that it just reaches around the cylinder. Say, "The length of this string is the circumference." Use another string and measure the

STRATEGY 2: cont'd

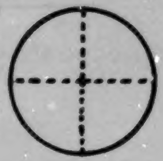
diameter. Cut the string. Compare the two lengths of string. Say, "We need about three pieces of string the length of the diameter to equal the circumference."

Repeat this procedure using several cylinders of different sizes.

4.10.05.03 **find the relationship between radius and circumference**

STRATEGY 1: Prepare and distribute circles, string and scissors to each student. Say, "Fold the circle into four equal parts. Each little fold represents the radius."

e.g.,



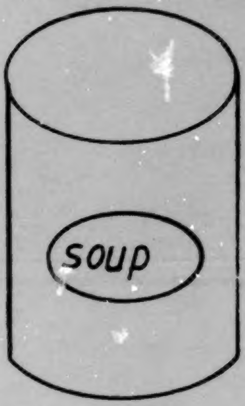
Ask the students to use the string to measure the radius. Say, "Cut the string to show the length of the radius. Use the remaining string and find the circumference. Cut the string. How many pieces of string the length of the radius do you need to equal the circumference? (a little more than six) Circumference is a little more than six times as big as the radius."

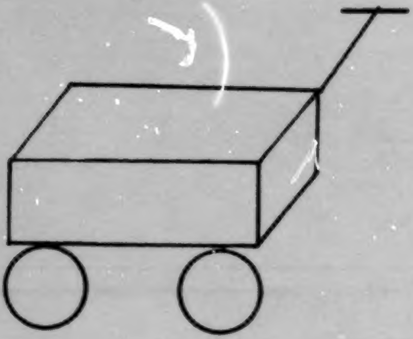
STRATEGY 2: Prepare and distribute a paper circle with a radius of 2 cm, string and scissors to each student. Ask students to explore ways to find the approximate circumference given only the radius. After the students have worked for awhile, say, "Circumference is about six times the size of the radius."

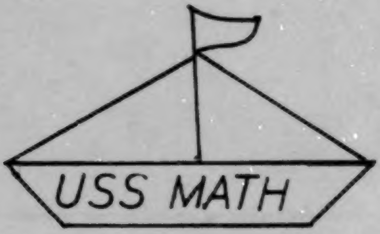
P.O. 4.10.05.01

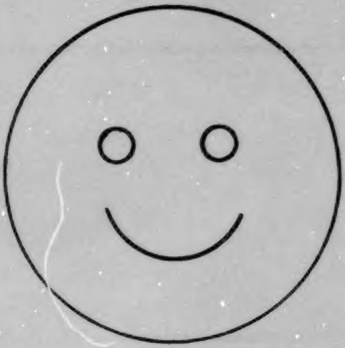
NAME: ______________________ CLASS: __________ DATE: ________

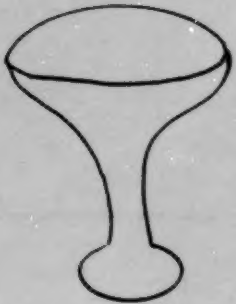
Color the objects that have a circumference.

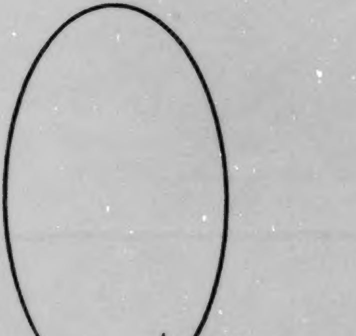


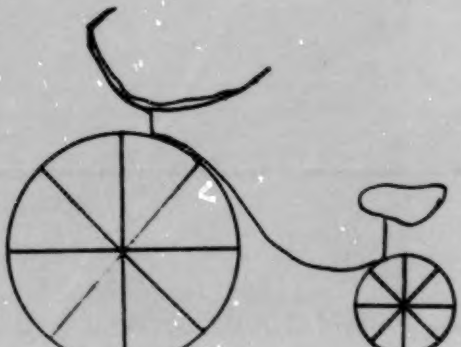












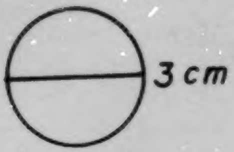
P.O. 4.10.05.02

NAME: ______________________________ CLASS: __________ DATE: ________

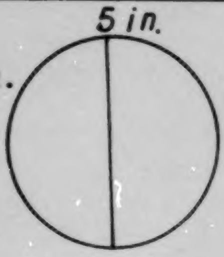
Use the diameter of each circle to find the appropriate circumference.

Work Space

1.



2.



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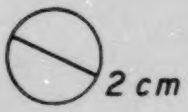

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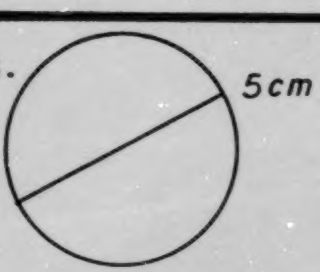
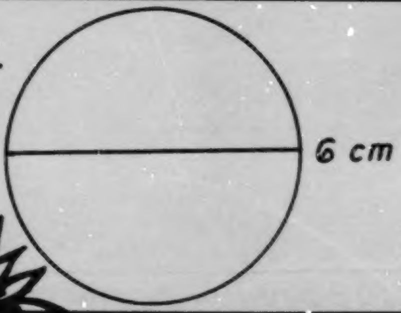


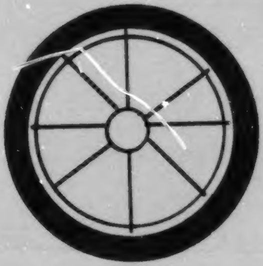
5.



P.O. 4.10.05.03

NAME: ______________________ CLASS: ________ DATE: ________

Find the circumference of these objects.



Bicyle tire
radius 33cm

Circumference ______________

Braclet
radius 3 cm

Circumference ______________

Fan
radius 25cm

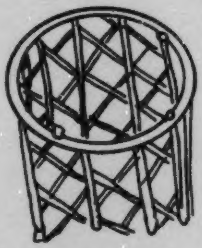
Circumference ______________

Ring
radius 1 cm

Circumference ______________

Birdbath
radius 40cm

Circumference ______________



Basketball hoop
radius 23 cm

Circumference ______________

Unit 42

4.11.01 OPEN SENTENCES

(2-3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.11.01.01A define an open sentence as a number sentence in which a letter or frame is used in place of a number; e.g.,

$$10 + y = 15$$

$$10 + \quad = 15$$

4.11.01.02A find the rule and write an open number sentence using a given table. e.g.,

□	△
10	7
11	8
12	__

$$\square - 3 = \triangle$$

4.11.01

VOCABULARY

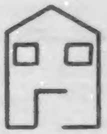
TERMS

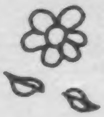
open sentence

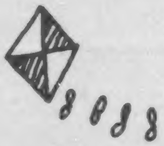
GETTING STARTED

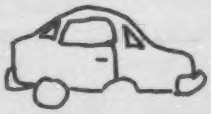
Prepare a set of cards with an incomplete sentence written on each card, e.g., Jack and Jill went up the... Ask a student to fill in the blank with a word which would make sense in the sentence. Continue this procedure until all of the cards have been used.

Draw pictures with parts of the picture missing on the chalkboard. e.g.,

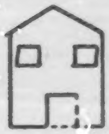








Ask students to come to the chalkboard and complete the picture. e.g.,



Ask students to draw incomplete pictures and ask other students to complete them.

4.11.01

4.11.01.01 **define an open sentence as a number sentence in which a letter or frame is used in place of a number**

STRATEGY 1: Write the following on the chalkboard.

e.g.,

$45 - 15 = \square$ $\quad$ $45 - 15 = n$

$45 - \square = 30$ $\quad$ $45 - n = 30$

Say, "Look at the first group of number sentences. How are they different?" (The box is in a different place.) Repeat this procedure for group 2. Say, "The first group of sentences uses a frame or box to represent the missing number and the second group uses a letter. These sentences are called open sentences because a letter or frame is used in place of a number."

STRATEGY 2: Prepare a balance scale. Write the following number sentences on the chalkboard.

e.g.,

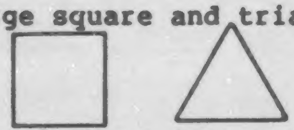
1) $45 + \square = 57$
2) $25 + n = 75$
3) $40 + 15 = 55$

Ask a student to use the balance scale to show sentence #1. Say, "Why doesn't the scale balance?" (A number is missing.) Repeat this procedure for #2. Ask a student to balance sentence #3. Say, "Number sentences, in which a letter or a frame is used in place of a number, are called open sentences." Continue this procedure using other examples.

4.11.01.02 **find the rule and write an open number sentence using a given table**

STRATEGY 1: Draw a large square and triangle on the chalkboard.

e.g.,



Say, "Pretend there is a man sitting behind the chalkboard. In front of him there is a big square

STRATEGY 1: cont'd

and a big triangle. He has a basket filled with numbers. Each time I put a number into the square, he does something to it. Sometimes he shrinks it. Sometimes he stretches it. Let's see if we can figure out what he is doing today." Draw a table on the chalkboard.

e.g.,

□	△

Say, "I am going to put 1 in the square." Write 1 in the table and pretend to push it into the large square. Say, "I wonder what will come out? Why, it's a four!" Write 4 under the triangle in the table. Say, "Let's put in a two. A 5 came out." Write these numbers in the table. Continue by putting 3 in and getting 6 out.

e.g.,

□	△
1	4
2	5
3	6

Say, "What is the man doing? (adding 3) We can write an open sentence to show what the man is doing." Write □+ 3 = △.

Continue this procedure using other examples.

STRATEGY 2: Prepare a die. Draw the following table on the chalkboard.

e.g.,

□	△

Ask a student to roll the die. Say, "I will write the number you roll under the square. I am going to do something to your number and write the new number under the triangle. Continue this procedure for three rolls.

e.g.,

□	△
2	8
6	24
3	12

Say, "What did I do to your numbers? (multiplied by 4) The rule for this table is □ x 4 = △."

Continue this procedure.

P.O. 4.11.01.01

NAME: ______________________ CLASS: ________ DATE: ________

Circle each open sentence and find its solution.

10	+	☐	=	4	+	13	=	16	−	☐	=	9
+		+		+		−		+		+		+
7	=	3	+	2	=	☐	+	10	+	4	+	8
=		+		+		=		+		+		+
☐	+	8	=	15	+	6	=	5	+	☐	=	14
+		+		=		=		+		−		+
12	−	5	=	☐	+	2	=	11	=	7	+	15
=		+		+		+		=		+		+
4	=	10	−	☐	=	3	=	☐	=	6	+	8
+		+		+		+		+		+		+
11	−	☐	=	7	−	0	−	13	=	2	+	7
+		+		+		+		+		+		+
☐	−	8	=	5	−	9	+	6	=	☐	+	11
+		+		+		+		=		−		−
8	+	☐	=	14	+	8	2	9	+	9	=	3
+		−		−		=		+		=		+
10	+	11	+	3	+	☐	=	3	+	☐	=	☐
=		+		=		+		=		+		=
18	−	7	=	☐	+	4	+	13	−	1	=	9

P.O. 4.11.01.02

NAME: ____________________ CLASS: __________ DATE: __________

Maria is working in the computer factory. She needs help in putting the computers in order. The computers show their input and output. Label each computer with an open sentence to show its rule. The first one is done for you.

Rule $\square - 5 = \triangle$

□	△
Input	Output
12	7
15	10
19	14
20	15

Rule ____________

□	△
Input	Output
10	2
25	5
40	8
15	3

Rule ____________

□	△
Input	Output
13	22
43	52
21	30
36	45

Rule ____________

□	△
Input	Output
3	30
27	270
19	190
44	440

Rule ____________

□	△
Input	Output
49	7
35	5
7	1
14	2

Rule ____________

□	△
Input	Output
9	72
4	32
8	64
7	56

4.02.02 ASSOCIATIVE PROPERTY IN ADDITION

(1 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

4.02.02.01A use the associative property of addition; e.g.,

(18 + 22) + 3	18 + (22 + 3)
40 + 3	18 + 25
43	43

4.02.02.02A solve word problems related to skills learned in this module. e.g.,

Sally had 132 marbles. Her friend gave her 20 marbles and she bought 100 more. How many marbles did she have in all?

(132+20) + 100	132 + (20+100)
152 + 100	132 + 120
252 marbles	252 marbles

142

4.02.02

VOCABULARY

TERMS

associative

GETTING STARTED

Distribute colored rods to students. Ask the students to place a red, purple and yellow rod on their desks and make a train. Say, "Use enough white rods to equal the length of your train. How many white rods did you use? (11) We are going to make another train. This time, place the rods in the following order. Yellow, red and purple. Use enough white rods to equal the length of this train. How many rods did you use? (11) What do you notice about the number of white rods we used each time?" (We used the same number.) Repeat this procedure for other rods.

Ask the students to write the numbers 2 through 9 on their papers. Say, "Circle any two numbers that, when added together, will have a sum of 12." Ask a student to place his/her equation on the chalkboard, e.g., 4 + 8 = 12. Call on another student to use his/her numbers, e.g., 9 + 3 = 12. Repeat this procedure for all sums of 12.

Ask students to again write the numbers 2 through 9 on their papers. Say, "Circle any two numbers that when added together, will have a sum of 13." Call on a student to write the equation on the chalkboard, e.g., 9 + 4 = 13.

Repeat this procedure for sums of 14 through 18.

4.02.02

4.02.02.01 **use the associative property of addition**

STRATEGY 1: Distribute bead boards to students. Say, "Karen needs three beads for the first strand of a necklace, five beads for the second strand, and eight beads for the third strand. Move the beads on your bead board to show the three strands. How can we find the number of beads Karen needs? (add) How many beads are in the first and second rows? (3 + 5 = 8) How many beads are in the third row? (8) How many beads in all?" (16) Write (3 + 5) + 8 = 8 + 8 = 16 on the chalkboard. Say, "We can add these numbers in a different way." Write 3 + (5 + 8) = 3 + 13 = 16 on the chalkboard. Say, "What was the sum in the first example? (16) ...in the second example? (16) What was different about the way we added the numbers? (In the first example, the first two numbers are grouped and in the second example, the last two numbers are grouped.) Did the sum change?" (No)

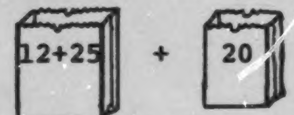
STRATEGY 2: Draw a chart, listing items to be sold at a cake sale, on the chalkboard.

e.g.,

Cookie - 12¢
Donut - 25¢
Cupcake - 20¢

Say "I would like to buy all three. Please place the cookie and donut in one bag and the cupcake in another bag. Write the prices on each bag." Draw the following on the chalkboard.

e.g.,



(12 + 25) + 20
37¢ + 20¢ = 57¢

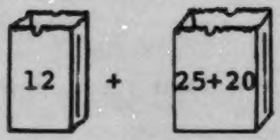
Say, "Please place the cookie in one bag and the donut and cupcake in the other." Draw the following on the chalkboard.

480

4.02.02

STRATEGY 2: cont'd

e.g.,



12 + (25 + 20)
12 + 45 = 57¢

Say, "In the first example, we added the first two addends and then the third. In the second example, we added the last two addends to the first addend. What is the same in both examples?" (the sum)

4.02.02.02 **solve word problems related to skills learned in this module**

STRATEGY 1: Write a word problem on the chalkboard.

> The Mets scored 3 runs in the first inning, 3 runs in the second inning and 4 runs in the third inning. How many runs did they score?

Say, "What is the easiest way to find the total runs?" (add) Write the following on the chalkboard.

e.g.,

(3 + 3) + 4	3 + (3 + 4)
6 + 4	3 + 7
10	10

Repeat this procedure using other addends.

STRATEGY 2: Write this problem on the chalkboard.

> I am purchasing milk for 53¢, juice for 55¢ and fruit for 21¢. What is the total cost?

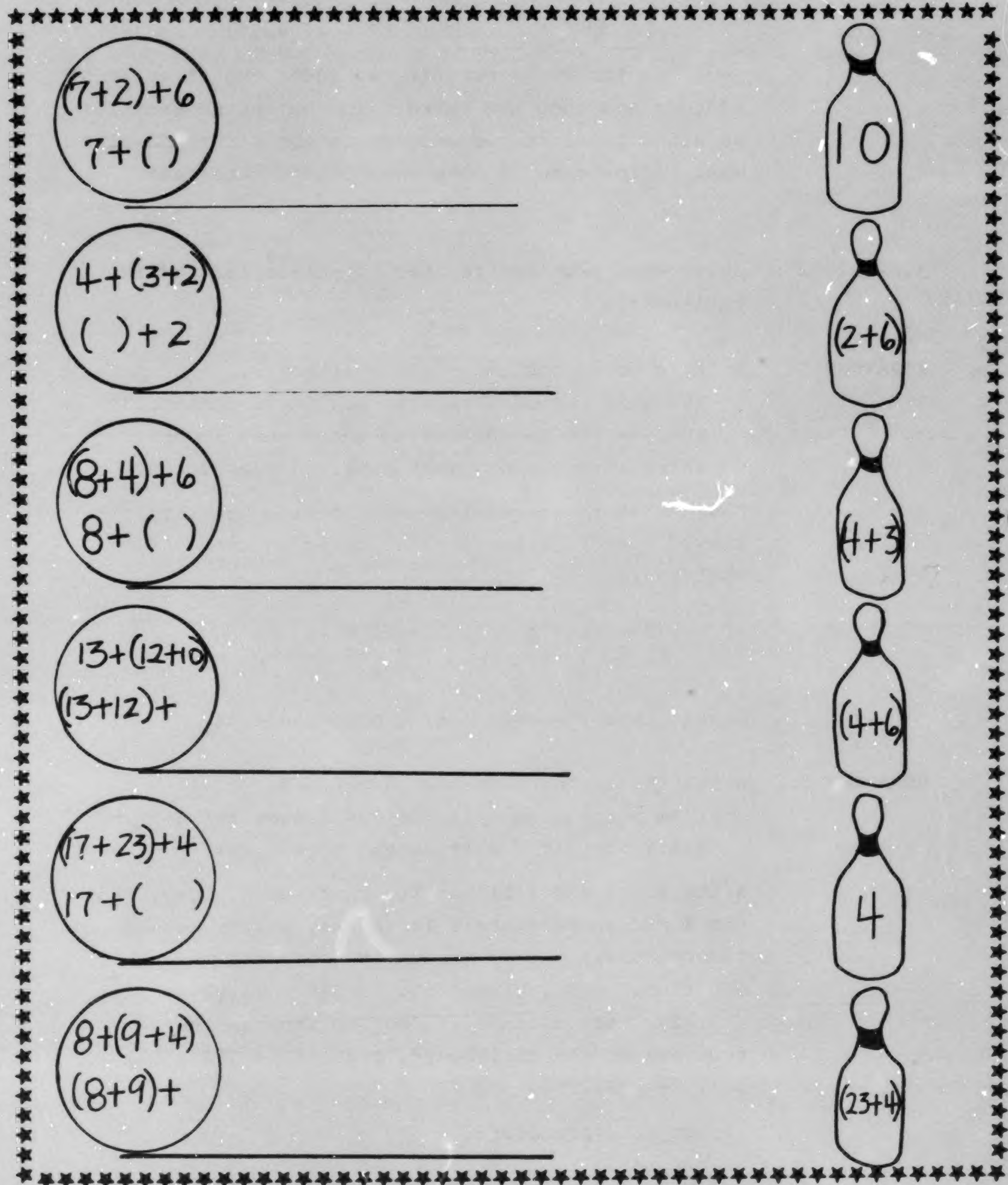
Write 53¢ + 55¢ + 21¢ on the chalkboard. Say, "How can I add three numbers in an easy way?" (group two together) Ask a student to complete the addition. e.g., (53¢ + 55¢) + 21¢ = $1.08 + 21¢ = $1.29. Ask another student to show another grouping at the chalkboard, e.g., 53 + (55 + 21) = 53 + 76 = $1.29.

Repeat this procedure.

P.O. 4.02.02.01

NAME: ______________________ CLASS: __________ DATE: ________

Get a strike. Knockdown the pin with the bowling ball by matching the addition example with the numbers that complete it, solve each example .


(7+2)+6
7+( )
4+(3+2)
( )+2
(8+4)+6
8+( )
13+(12+10)
(13+12)+
(17+23)+4
17+(   )
8+(9+4)
(8+9)+
10
(2+6)
(4+3)
(4+6)
4
(23+4)

P.O. 4.02.02.02

NAME:______________________________ CLASS:__________ DATE:________

Mr. and Mrs. Brown and their three children went to a restaurant for lunch. Use the menu to find the cost of each meal. Solve each problem in two ways using the associative property of addition.

Menu

Hamburger......	$1.25
Cheeseburger....	$1.50
Frankfurter.....	$1.20
Salad.........	$ .75
French Fries...	$ .95

Soda......	$ .60
Coffee.....	$ .40
Ice Cream....	$ .95
Cake......	$1.35

	Method 1	Method 2
① Mr. Brown ate salad, one hamburger and coffee. What was the cost of his lunch? ______		
② Mrs. Brown ate a cheeseburger, french fries and soda. What was the cost of her lunch? _________		
③ Derrick ate 2 frankfurters and an ice-cream. What was the cost of his lunch? _________		
④ Timmy had salad, soda and cake. What was the cost of his lunch? _______		
⑤ Carol ate one frankfurter, salad and ice cream. What was the cost of her lunch? _________		
⑥ If you had gone to lunch with the Brown family what would you have eaten? Choose three items and find their total cost. _________		

453

4.02.03 ADDITION OF 5-DIGIT NUMBERS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.02.03.01A add two 5-digit numbers;

e.g,

```
 59,624
+32,232
 91,856
```

4.02.03.02A add three or more 5-digit numbers;

e.g.,

```
$  324.06
   434.62
   243.13
$1,001.81
```

4.02.03.03A solve word problems related to skills learned in this module.

e.g.,

Our school district had three separate deliveries of pencils last year. 15,238 pencils were delivered in January, 22,465 in May, and 18,562 in September. How many pencils were delivered last year?

```
15,238
22,465
18,562
56,265
```

4.02.03

VOCABULARY

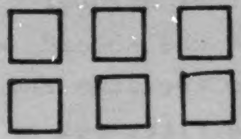
TERMS

place value
expanded notation
exchange

GETTING STARTED

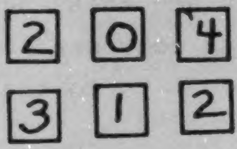
Prepare a set of cards numbered from 0 through 4. Shuffle the cards. Draw six boxes on the chalkboard.

e.g.,



Ask a student to choose six cards and write one number in each box on the chalkboard. Say, "What numbers did you make on the chalkboard?"

e.g.,



Ask a student to complete the addition.

Repeat this procedure using other cards.

Ask a student to come to the chalkboard and write any 4-digit number with two digits greater than 5. Ask another student to write another 4-digit number on the chalkboard. Say, "Write the numbers so that they can be added." Ask a third student to write a 4-digit number on the chalkboard and place it so that it can be added to the first two numbers. Say, "Are all of the corresponding digits in a straight line?" Ask a student to do the addition.

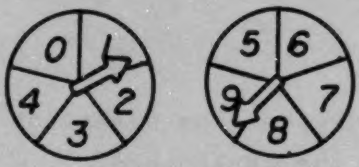
Repeat this procedure.

4.02.03

4.02.03.01 add two 5-digit numbers

STRATEGY 1: Prepare two spinners divided into five regions. Write a 1-digit number in each region.

e.g.,



Ask a student to spin either spinner five times and record the numbers on the chalkboard, e.g., 68012. Ask another student to do the same and write his/her results under the first set of numbers.

e.g.,

68012
47935

Say, "We are going to add these numbers. We start in the ones column and continue adding from right to left." Ask a student to do the addition through the hundreds column.

e.g.,

68012
+47935
947

Say, "How much is 8000 + 7000? (15,000) We regroup 10 one thousands as 1 ten thousand. We put the 1 in the ten thousands place to show our regrouping.

e.g.,

1
68012
+47935
5947

Ask a student to complete the example.

Repeat this procedure.

STRATEGY 2: Write the following example on the chalkboard. e.g.,

$$\begin{array}{r} 17584 \\ +\underline{12906} \end{array}$$

Say, "When we add and get sums greater than ten, we must regroup." Ask a student to add the ones and regroup. Ask a second student to add the tens. Ask a third student to add the hundreds and regroup. Continue this procedure until the addition is completed.

Repeat this procedure using other numbers.

4.02.03.02 add three or more 5-digit numbers

STRATEGY 1: Write the following example on the chalkboard. e.g.,

$$\begin{array}{r} 56781 \\ 23415 \\ \underline{23110} \end{array}$$

Say, "When adding columns of numbers we start at the ones, go on to the tens, the hundreds, thousands and ten thousands. Remember, when we have ten or more in any column, we must regroup. Think of each pair of numbers in any column as an example." Point to the ones column. Say, "1 + 5 = 6. 6 + 0 = 6. Now we go on to the tens column. 8 + 1 = 9. 9 + 1 = 10. We must regroup the 10 tens as 1 hundred." Ask a student to complete the addition.

STRATEGY 2: Prepare one die. Ask a student to roll the die five times and record the tosses as a 5-digit number on the chalkboard, e.g., 62311. Repeat this procedure with two more students. Ask a student to follow the procedure by saying, "Line up these

STRATEGY 2: cont'd

three numbers so that we have an addition example."
e.g.,

```
62311
44316
56123
```

Ask a student to do the addition, remembering to regroup when necessary.

Repeat this procedure.

4.02.03.03 **solve word problems related to skills learned in this module**

STRATEGY 1: Write the following word problem on the chalkboard.

> The fourth grade in our school held three cake sales. They made $121.25 the first time, $263.25 the second time and $100.00 the last time. How much money did they make in all?

Ask a student to read the problem. Ask another student to identify the key words and write an example to solve the problem. Ask a third student to complete the addition.

Continue this procedure using other problems.

STRATEGY 2: Write the following word problem on the chalkboard.

> A toll collector collected tolls from 11,281 cars on Monday, 13,984 cars on Tuesday and 21,000 cars on Friday. How many cars passed through his toll gate in those three days?

Ask a student to solve the problem using good problem solving techniques.

Continue this procedure using other problems.

P.O. 4.02.03.01

NAME: ______________________ CLASS: __________ DATE: ________

Add. Use the key to solve the riddle.

If 10 dragons are a clan and 20 dragons are a herd, what are 30 and 40?

E	N	S	T	V	Y
76,921	84,044	35,813	127,703	88,888	117,554

a) 12345
+23468
35813

b) 60132
+16789

c) 33355
+55533

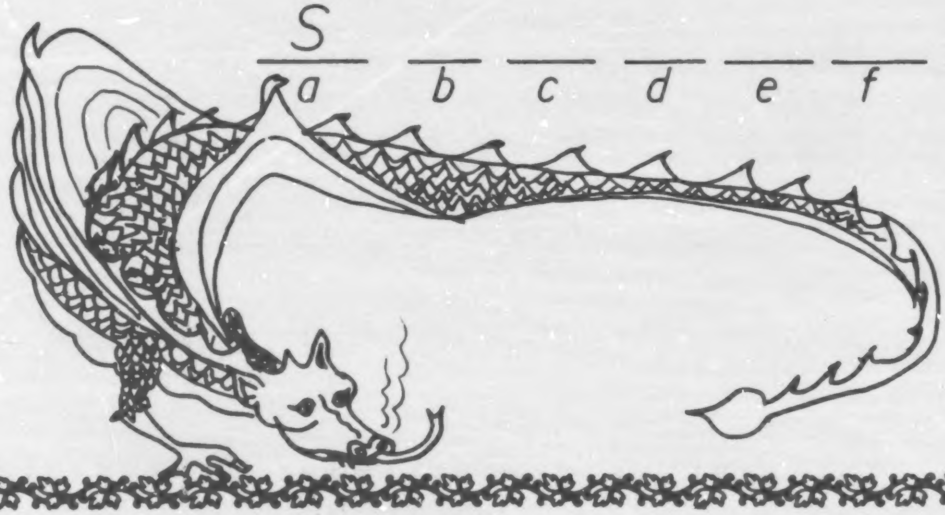
d) 28450
+48471

e) 35425
+48619

f) 73628
+54075

g) 42856
+74698

S ___ ___ ___ ___ ___ ___
a b c d e f g



P.O. 4.02.03.02

NAME: ______________________ CLASS: __________ DATE: ________

Add. Use the key to solve the riddle.

HOW IS A BASEBALL TEAM LIKE A PANCAKE?

THEY ____________________

____________________.

11,561
12,311
14,811
42733
Ⓑ

12,901
17,421
16,312
○

80,101
74,612
59423
○

36,334
77,545
45,756
○

95,500
14,050
62,831
○

12,345
67,890
54,321
○

67,890
54,321
12,345
○

26,320
75,410
21,800
○

58,261
26,342
45,343
○

1,2311
1,4811
1,5611
○

26,342
58,261
45,343
○

36,334
45,756
77,545
○

45,756
36,334
77,545
○

54,321
67,890
12,345
○

76325
81804
97235
○

KEY

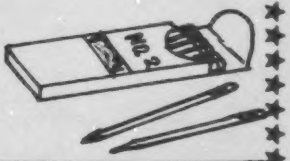
A-12994
B-42733
D-123530
H-159635
E-134556
N-172381
O-46634
R-255364
T-159635

P.O. 4.02.03.03

NAME:______________________________ CLASS:________ DATE:_______

Solve each problem.

1. Our school district had three deliveries of pencils last year. 15,238 books were delivered in January, 22,465 in May and 18,562 in September. How many pencils were delivered last year?



2. Mr. and Mrs. Smith bought new furniture for their apartment. They bought a chair for $249.99, a bookcase for $117.50 and a dining table for $385.50. How much did they spend in all?

3. The museum had a special showing for only three days. On Monday 11281 people came to see the show, 16060 on Tuesday and 10420 on Wednesday. How many people saw the show?

4. The chocolate chocolate cookie company supplies many stores with cookies. They deliver three times a week. On Monday they delivered 20,000 cookies, 15,500 on Wednesday and 30,000 on Firday. How many cookies did they deliver in all?

4.03.02 SUBTRACTION OF 5-DIGIT NUMBERS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.03.02.01A subtract a 2-, 3-, 4- and 5-digit number from a 5-digit number and check;

e.g.,

$$\begin{array}{rr} & \underline{\text{check}} \\ 86,972 & 59,851 \\ \underline{-59,851} & \underline{+27,121} \\ 27,121 & 86,972 \end{array}$$

4.03.02.02A subtract a 2-, 3-, 4- and 5-digit number from 10,000 and multiples of 10,000 and check;

e.g.,

$$\begin{array}{rr} & \underline{\text{check}} \\ \cancel{1}\overset{9}{\cancel{0}},\overset{9}{\cancel{0}}\overset{9}{\cancel{0}}\overset{10}{\cancel{0}} & 5,678 \\ \underline{-5,678} & \underline{+4,322} \\ 4,322 & 10,000 \end{array}$$

4.03.02.03A solve word problems related to skills learned in this module.

e.g.,

There were 34,283 people at the automobile show on the first week and 13,142 people on the second week. How many more people attended on the first week?

$$\begin{array}{rlr} & & \underline{\text{check}} \\ 34,283 & & 13,142 \\ \underline{-13,142} & & \underline{+21,141} \\ 21,141 & \text{people} & 34,283 \end{array}$$

4.03.02

VOCABULARY

TERMS

regrouping
minuends
subtrahends
difference

GETTING STARTED

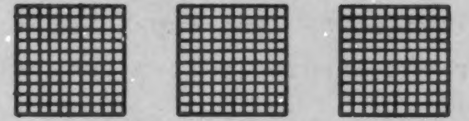
Prepare a set of squared material. Write the following example on the chalkboard.

e.g.,

$$\begin{array}{r} 300 \\ \underline{-195} \end{array}$$

Ask a student to show 300 using the squared material.

e.g.,



Ask another student to take away 5 ones. Say, "Can you do it? (no) We must regroup one hundred as 10 tens. Can we take away 5 ones? (no) We must regroup 1 ten as 10 ones. Before we take away 5 ones, let's count our material. We have 2 hundreds, 9 tens and 10 ones. Can we take away 5 ones? (yes) How many are left?" (5) Write the following on the chalkboard and show the regroupings.

$$\begin{array}{r} \overset{2}{\cancel{3}}\overset{9}{\cancel{0}}0 \\ \underline{-195} \\ 5 \end{array}$$

Complete the subtraction both using material and at the chalkboard.

Write the following examples on the chalkboard.

e.g.,

$$\begin{array}{rrrr} 1)\ 392 & 2)\ 736 & 3)\ 422 & 4)\ 345 \\ \underline{-211} & \underline{-318} & \underline{-151} & \underline{-169} \end{array}$$

Ask four different students to do the examples. Discuss regrouping procedures.

4.03.02

4.03.02.01 **subtract a 2-, 3-, 4- and 5-digit number from a 5-digit number and check**

STRATEGY 1: Write the following example on the chalkboard.

e.g.,
$$\begin{array}{r} 91326 \\ -\ \ 87 \\ \hline \end{array}$$

Point to the ones column. Say, "Can you take 7 away from 6? (No) What must we do?" (Regroup) Ask a student to regroup one ten as ten ones and subtract in the ones column.

e.g.,
$$\begin{array}{r} 913\overset{1}{\cancel{2}}\overset{1}{6} \\ -\ \ 87 \\ \hline 9 \end{array}$$

Point to the tens column. Say, "Can we take 8 away from 1? What must we do?" (Regroup) Ask a student to regroup one hundred as ten tens and subtract.

e.g.,
$$\begin{array}{r} 91\overset{2}{\cancel{3}}\overset{11}{\cancel{2}}6 \\ -\ \ 87 \\ \hline 39 \end{array}$$

Ask a student to complete the subtraction. Continue this procedure subtracting 3-, 4- and 5-digit numbers from a 5-digit number.

STRATEGY 2: Draw a place value chart on the chalkboard. Ask a student to write a 5-digit number in the chart. Ask another student to write a 3-digit number in the chart.

e.g.,

Ten Thousands	Thousands	Hundreds	Tens	Ones
9	8	7	6	5
-		3	4	9

Ask a student to subtract the example showing the necessary regroupings as he/she works.

Continue this procedure for other examples using 2-, 4- and 5-digit numbers.

4.03.02

4.03.02.02 subtract a 2-, 3-, 4- and 5-digit number from 10,000 and multiples of 10,000 and check

STRATEGY 1: Draw a place value chart on the chalkboard and place the following example in the chart.

e.g.,

	T Th	Th	H	T	O
	1	0	0	0	0
-			3	1	6

Ask a student to subtract in the ones column. Say, "There are no ones here. What must we do? (Regroup 1 ten as 10 ones.) But there are no tens. What shall we do? (Regroup 1 hundred as 10 tens.) But there are no hundreds. (Regroup 1 thousand as 10 hundreds.) But there are no thousands." (Regroup 1 ten thousand as 10 thousands.) Point to the ten thousands place. Say, "Finally, we have a number. Let us take the one ten thousand and exchange it for ten thousands." Show this on the chalkboard.

e.g.,

T Th	Th
~~1~~	10

Say, "How many ten thousands are left? (0) How many thousands? (10) We must regroup 1 thousand as 10 hundreds." Show this on the chalkboard.

e.g.,

T Th	Th	H
0	9	
~~1~~	~~10~~	10

Say, "How many thousands are left? (9) How many hundreds? (10) Regroup one hundred as ten tens." Show this on the chalkboard.

e.g.,

T Th	Th	H	T
0	9	9	
~~1~~	~~10~~	~~10~~	10

Say, "How many hundreds? (9) How many tens? (10) Regroup 1 ten as 10 ones." Show this on the chalkboard.

STRATEGY 1: cont'd

e.g.,

T Th	Th	H	T	O
0	9	9	9	
~~1~~	~~10~~	~~10~~	~~10~~	10

Say, "How many tens? (9) How many ones? (10) Now we can subtract." Ask a student to complete the subtraction.

Repeat this procedure with other numbers.

STRATEGY 2: Adapt Strategy 2 used in P.O. 4.03.02.01 for this lesson.

4.03.02.03 **solve word problems related to skills learned in this module**

STRATEGY 1: Write this problem on the chalkboard.

> On Monday, the New York Times sold 29,930 papers. On this same day, the New York Post sold 17,255 papers. How many more papers did the New York Times sell?

Ask a student to use good problem solving techniques to solve the problem. Say, "Choose the correct operation. Write a number sentence. Solve the number sentence and label your answer."

STRATEGY 2: Write the following problem on the chalkboard.

> There are 20,000 boys in the Valley School District. There are 19,223 girls in this same school district. How many more boys are there than girls?"

Discuss good problem solving techniques with the students, e.g., read the problem, determine the operation, solve and label the answer. Ask the students to solve the problem using these problem solving techniques.

P.O. 4.03.02.01

NAME: ______________________ CLASS: __________ DATE: ________

Solve the subtraction examples. Use the code to find the secret message.

① 573,109
-56,107
17,002

② 94,949
-12,843

③ 47,796
-28,615

④ 89,242
-68,100

⑤ 94,949
15,843

⑥ 78,343
56,211

⑦ 82,777
-14,555

⑧ 77,284
-56,142

⑨ 78,343
59,211

⑩ 82,777
-12,555

⑪ 79,353
58,211

⑫ 76,972
-58,441

⑬ 83,777
-13,555

⑭ 92,935
-17,115

⑮ 53,388
-15,178

70,222	19,132	38,210	75,820	17,002	21,142	68,222	82,106	79,106	18,531	19,181	22,132
T	N	C	I	Y	A	F	O	R	S	U	E

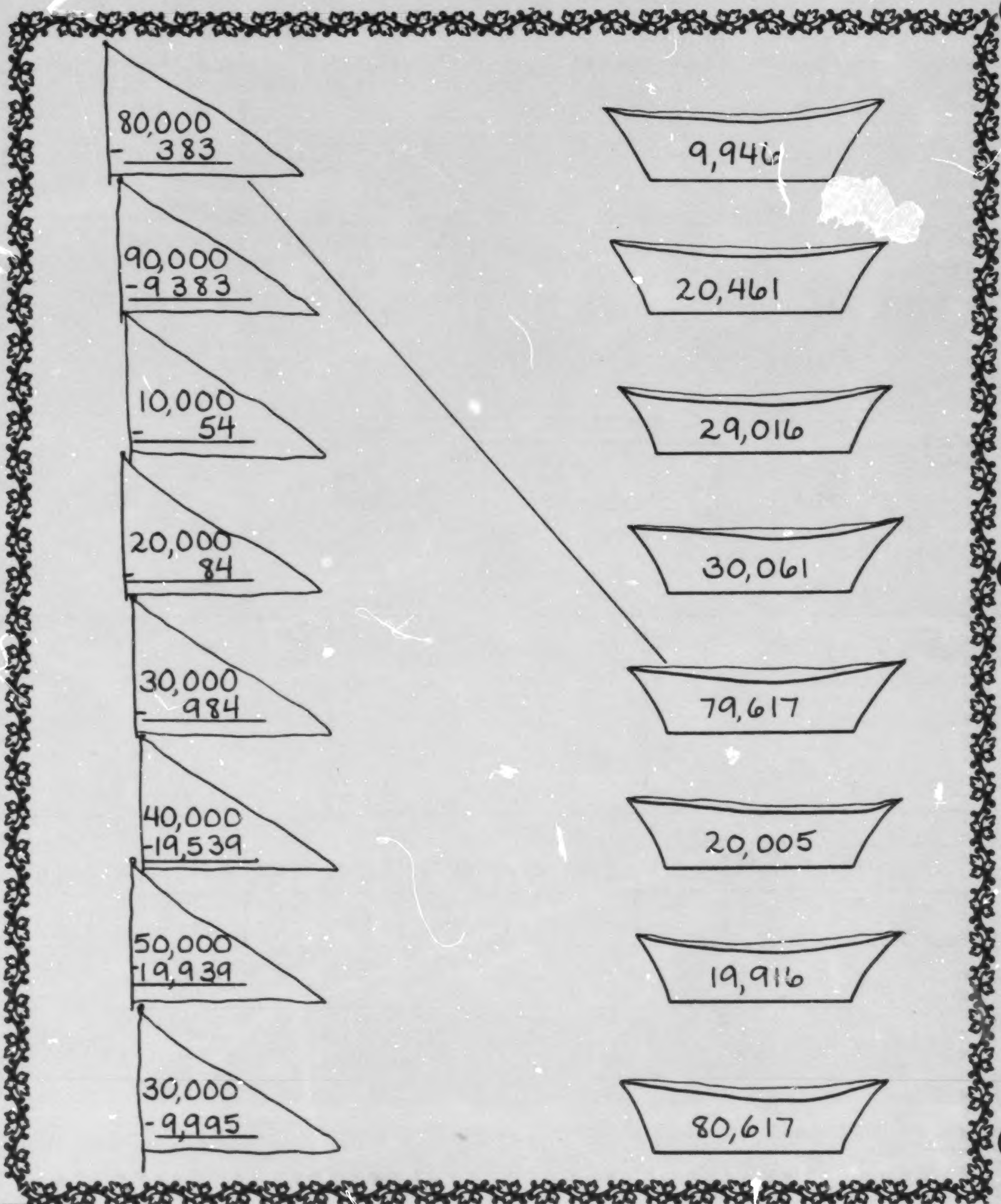
Y
___ ___ ___ ___ ___ ___
1 2 3 4 5 6

___ ___ ___ ___ ___ ___ ___ ___ ___
7 8 9 10 11 12 13 14 15

P.O. 4.03.02.02

NAME: ________________________ CLASS: __________ DATE: __________

Put the sail on the boat by matching the subtraction example to its answer.


80,000
- 383
90,000
-9 383
10,000
- 54
20,000
- 84
30,000
- 984
40,000
-19,539
50,000
-19,939
30,000
-9,995
9,946
20,461
29,016
30,061
79,617
20,005
19,916
80,617

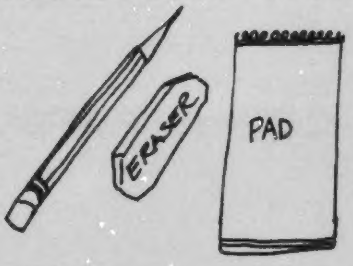
P.O. 4.03.02.03

NAME: ____________________ CLASS: ________ DATE: ______

Solve each word problem using the problem solving techniques.

Problem Solving Techniques

1. Read the problem.
2. Guesstimate when practical.
3. Determine the operation.
4. Round each number in the problem.
5. Estimate the answer.
6. Do the actual computations.
7. Is the answer close to the estimate?



1. A police force has 18,630 numbers. If 3,557 are women. how many members of the police force are nem?

2. Jane's mother has $560.00. She bought a coat for $179.99 How much money did she have left?

3. In 1970, there were 75,210 teachers in New York City. In 1980, there were 57,384 teachers. How many more teachers were there in 1970 than 1980?

4. Ebony Magazine sold 23,680 copies last month. Life sold 18,497 copies. How many more copies did Ebony sell than life?

4.04.02 PROPERTIES OF MULTIPLICATION

(1 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

4.04.02.01B use the associative property of multiplication over addition; e.g.,

$$
\begin{aligned}
2 \times 30 &= 2 \times (3 \times 10) \\
&= (2 \times 3) \times 10 \\
&= 6 \times 10 \\
&= 60
\end{aligned}
$$

4.04.02.02B use the distributive property of multiplication over addition. e.g.,

$$
\begin{aligned}
6 \times 18 &= 6 \times (10 + 8) \\
6 \times 18 &= (6 \times 10) + (6 \times 8) \\
108 &= (60) + (48) \\
108 &= 108
\end{aligned}
$$

4.04.02

VOCABULARY

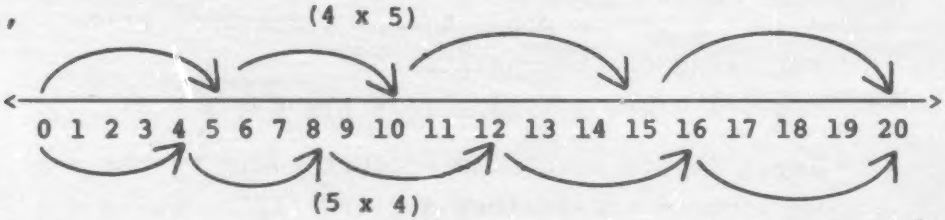
TERMS

associative property
distributive property
commutative property
array

GETTING STARTED

Draw a number line numbered from 0 through 20 on the chalkboard. Illustrate 4 x 5 on the number line.

e.g.,



Say, "We can think of 4 x 5 as 4 'jumps' of 5." Illustrate 5 x 4 on the number line. Say, "5 x 4 can be thought of as 5 'jumps' of 4. What is the product of 4 x 5? (20) What is the product of 5 x 4? (20) What do you notice about the factors 4 and 5?" (Factors are the same, their order is different.) Say, "Changing the order of the factors does not change the product. This is called the commutative property of multiplication."

Repeat this procedure using other factors.

Say, "Please give me six groups of zero pencils." Write 6 x 0 = on the chalkboard. Say, "How many pencils did you give me? (0) Any number times zero is zero." Ask different students to write an example using zero as one of the factors.

Say, "John, give me one group of six pencils. How many pencils do I have?" (6) Write 1 x 6 = 6. Say, "If you gave me one group of 20 pencils, how many pencils would I have? (20) The product of any number times one is always the number itself."

Continue using other examples with 1 as a factor.

4.04.02

4.04.02.01 **use the associative property of multiplication over addition**

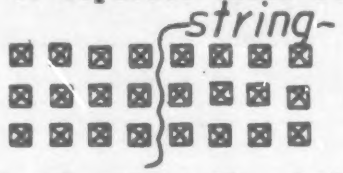
STRATEGY 1: Draw an array to show 4 x 6 on the chalkboard.
e.g.,

```
    A. xxxxxx        B. xxx xxx
       xxxxxx           xxx xxx
       xxxxxx           xxx xxx
       xxxxxx           xxx xxx
```

Separate the array as in B. Say, "We changed the grouping of the array. We have four rows and two sets of three. We write this as 4 x 2 x 3. How can we find the product of 4 x 2 x 3?" Write the following on the chalkboard.
e.g., 4 x 2 x 3 = (4 x 2) x 3 = 8 x 3 = 24

Say, "Do you think the product would be the same if we grouped the factors differently?" Write 4 x 2 x 3 = 4 x (2x3) = 4 x 6 = 24 on the chalkboard. Say, "Factors may be grouped in different ways when we multiply. This is called the associative property of multiplication."

STRATEGY 2: Prepare and distribute squared materials and a four inch piece of string to each student. Say, "Use the squared material to show three rows of 8 ones." Write 3 x 8 on the chalkboard. Say, "What are two factors of 8?" (2, 4) Ask the students to use the string to separate their display.
e.g.,



Write 3 x 2 x 4 on the chalkboard. Say, "To find the product of 3 numbers we multiply 2 factors and multiply their product by the third factor." Write the following on the chalkboard.
e.g., 3 x 2 x 4 = (3 x 2) x 4 = 6 x 4 = 24
Say, "What would happen if we changed the way we grouped the factors?" (The product would be the

STRATEGY 2: cont'd

same.) Write the following on the chalkboard.
e.g., 3 x 2 x 4 = 3 x (2 x 4) = 3 x 8 = 24

Repeat this procedure using other examples.

4.04.02.02 use the distributive property of multiplication over addition

STRATEGY 1: Draw an array on the chalkboard to represent 3 x 7, then separate it as in the examples below.

A.	B.	C.	D.
3 x 7	3 x (4 + 3)	(3 x 4)	(3 x 3)

Say, "What does array A represent? (3 x 7) How did we get 3 x (4 + 3) in B? (Distributed 7 as 4 + 3.) What does C represent? (3 x 4) ...D? (3 x 3) Do A and B have the same number of dots? (Yes) A equals C + D. Write the following on the chalkboard.
e.g.,
3 x 7 = 3 x (4+3) = (3x4) + (3x3) = 12 + 4 = 21

Say, "We have renamed factors to help us multiply. This property of multiplication is called the distributive property of multiplication."

Repeat this procedure using other examples.

STRATEGY 2: Prepare and distribute squared material. Say, "Use the squared material to represent the number 14. What is another name for 14? (10 + 4) We can rename 14 to find the product of 2 x 14. Use your squared material to solve the problem." Write the following on the chalkboard.
e.g.,
2 x 14 = 2 x (10+4) = (2x10) + (2x4) = 20 + 8 = 28

Say, "We renamed 14 as 10 + 4. Multiplication by 2 is distributed over the addends 10 and 4. This property is called the distributive property of multiplication over addition."

Repeat this procedure using other numbers.

P.O. 4.04.02.01

NAME: ____________________ CLASS: ________ DATE: ________

Kim's dog chewed up part of her homework. Help her get an A by filling in the missing numbers.

P.S. 327 Kim Brown

4-121 Jan 24, 1983

Solve these problems using the associative property of multiplication.

① 6x40 = 6x(4x ___)
=(6x ___) x ___
= 24x ___
= ___

② 8x50 = ___ x (5x ___)
=(8 x ___) x 10
= ___ x ___
= ___

③ 4x5x4 = 4x(___ x ___)
= ___ x 20
= ___

④ 8x5x2 = (8x ___) x 2
= ___ x ___
= ___

⑤ 7x30 = 7x((___ x 10)
= ___ x3) x 10
= ___ x ___
= ___

⑥ 9x30 = ___ x ((___ x10)
=(9 x ___) x 10
= ___ x ___
= ___

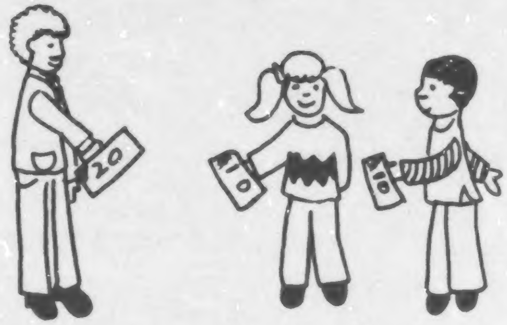
⑦ 7x9x6 = 7x(___ x6)
= 7x ___
= ___

⑧ 8x50 = ___ x (5x10)
= ___ x ___
= ___

P.O. 4.04.02.02

NAME: ______________________ CLASS: __________ DATE: ________

Use the distributive property of multiplication to solve each example.



$34 \times 31 = (34 \times 30) + (34 \times 1)$

$= 1020 + 34$

$= 1054$

$53 \times 54 =$

$83 \times 24 =$

$18 \times 24 =$

$75 \times 63 =$

$42 \times 46 =$

Unit 47

4.04.03 MULTIPLICATION BY A 1-DIGIT NUMBER

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.04.03.01A multiply 10, 100, 1,000 and 10,000 by a 1-digit number;

e.g.,

$$\begin{array}{rrrr} 10 & 100 & 1{,}000 & 10{,}000 \\ \underline{\times 2} & \underline{\times\ 2} & \underline{\times\ \ \ 2} & \underline{\times\ \ \ 2} \\ 20 & 200 & 2{,}000 & 20{,}000 \end{array}$$

4.04.03.02A multiply 2-, 3- and 4-digit numbers by a 1-digit number without regrouping;

e.g.,

$$\begin{array}{rrr} 21 & \$3.21 & 2{,}211 \\ \underline{\times\ 3} & \underline{\times\ \ \ 3} & \underline{\times\ \ \ 4} \\ 63 & \$9.63 & 8{,}844 \end{array}$$

4.04.03.03A multiply 2-, 3- and 4-digit numbers by a 1-digit number with regrouping;

e.g.,

$$\begin{array}{rrr} 24 & \$3.24 & 2{,}324 \\ \underline{\times\ 6} & \underline{\times\ \ \ 6} & \underline{\times\ \ \ 6} \\ 144 & \$19.44 & 13{,}944 \end{array}$$

4.04.03.04A solve word problems related to skills learned in this module.

e.g.,

There are 41 books in one box. How many books are there in 9 boxes?

$$\begin{array}{r} 41 \\ \underline{\times\ 9} \\ 369 \end{array} \text{ books}$$

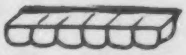
4.04.03

VOCABULARY

TERMS

product
multiplicand
multiplier

GETTING STARTED

Prepare an egg carton broken in half, e.g.,  Say, "How many beans do I need if two are placed in each cup. Ask a student to put two discs in each cup. We could add 2 + 2 + 2 + 2 + 2 and find we need 12. A faster way would be to multiply 6 X 2 to find we need 12 beans.

Continue this procedure using other numbers.

Write the following chart on the chalkboard.

Additions	Multiplication Fact
6 + 6 + 6 + 6 + 6	5 X 6 = 30
7 + 7 + 7	3 X 7 = 21
5 + 5 + 5	3 x 5 = 15

Ask the students to copy the chart in their notebooks and rewrite the additions as multiplication facts.

Present the multiplication fact and ask the students to write the addition.

Continue this procedure using other numbers.

4.04.03

4.04.03.01 **multiply 10, 100, 1,000 and 10,000 by a 1-digit number**

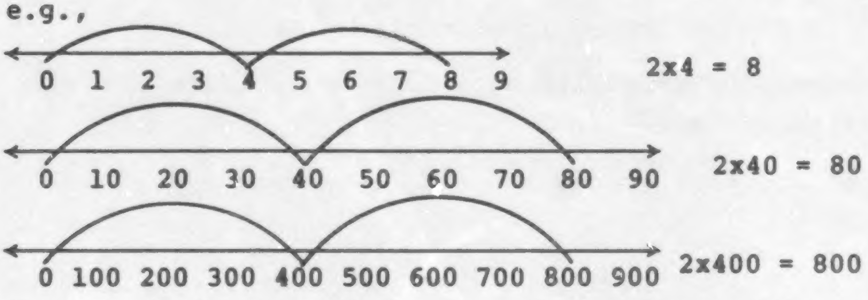
STRATEGY 1: Prepare and distribute graph paper. Ask the students to shade one row of ten squares. Write 1 x 10 = 10 on the chalkboard. Ask the students to continue this procedure through nine rows of ten. Write the equations on the chalkboard. Say, "What digit is in the ones place of each product? (0) What digit is in the tens place? (The number of tens multiplied.) We can apply this rule when we multiply 100, 1,000 and 10,000 by any 1-digit number." Write the following on the chalkboard. e.g.,

$$\begin{array}{r} 100 \\ \underline{\times\ 2} \\ 200 \end{array} \qquad \begin{array}{r} 1000 \\ \underline{\times\ \ 2} \\ 2000 \end{array} \qquad \begin{array}{r} 10,000 \\ \underline{\times\ \ \ \ 2} \\ 20,000 \end{array}$$

Say, "How did we get the products?" (We multiplied the non-zero numbers, counted the number of zeros in the multiplicand, and placed that number of zeros in the product.)

Continue this procedure using other numbers.

STRATEGY 2: Draw the following number lines on the chalkboard. e.g.,



Say, "What is the pattern?" (The product has the same number of zeros as the multiplicand, and the digit in the highest place is the product of the two non-zero numbers.)

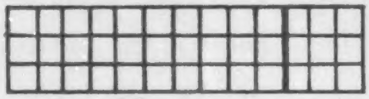
Continue this procedure through multiples of 10,000.

4.04.03

4.04.03.02 **multiply 2-, 3- and 4-digit numbers by a 1-digit number without regrouping**

STRATEGY 1: Prepare and distribute a sheet of graph paper. Ask the students to draw a 3 by 13 rectangle.

e.g.,



3 x 13

Say, "What is another name for 13? (10 + 3) Draw a line to separate the 13 boxes into 10 boxes and 3 boxes as shown above. Label your rectangle."

Write the following on the chalkboard.

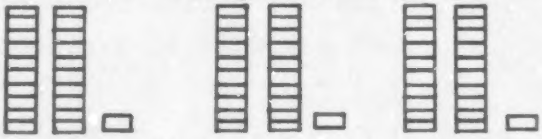
$$\begin{array}{r} \underline{A} \\ 13 \\ \underline{\times 3} \end{array} = \begin{array}{r} \underline{B} \\ \overline{10 + 3} \\ \underline{\times \quad\quad 3} \end{array} = \begin{array}{r} \underline{C} \\ 10 \\ \underline{\times 3} \\ 30 \end{array} \begin{array}{c} \\ \\ + \\ + \end{array} \begin{array}{r} \underline{D} \\ 3 \\ \underline{\times 3} \\ 9 \end{array} = 39$$

Say, "3 x 3 = 9, 10 x 3 = 30, 30 + 9 = 39. We used the distributive property of multiplication to solve our problem." Refer to A on the chalkboard. Say, "We can multiply a shorter way. Multiply 3 x 3 and write 9 in the ones place. Multiply 3 x 10 and place the 3 next to the 9 ones."

Repeat this procedure though the multiplication of a 4-digit number.

STRATEGY 2: Prepare three sets of squared materials to represent 3 x 21.

e.g.,



Say, "What number does each group of material represent? (21) How many groups are there? (3) How can we find out how many squares are in all three groups?" (3 x 21) Ask a student to rename 21 (20 + 1) and write the following on the chalkboard.

$$\text{A)}\quad \begin{array}{r} 20 \\ \underline{\times 3} \\ 60 \end{array} \begin{array}{c} \\ + \\ + \end{array} \begin{array}{r} 1 \\ \underline{\times 3} \\ 3 \end{array} = 63 \qquad\qquad \text{B)}\quad \begin{array}{rl} 21 & \\ \underline{\times 3} & \\ 3 & (3 \times 1) \\ \underline{60} & (3 \times 20) \\ 63 & \end{array}$$

Ask two students to perform the multiplication in

4.04.03

STRATEGY 2: cont'd

A. Say, "We can multiply using a shorter method. Look at example B. Multiply in the ones place. How much is 3 x 1? (3) What is the product of 3 x 2? (6) What do you notice about the product in examples A and B?" (They are the same.)

Extend this procedure to include 4-digit numbers.

4.04.03.03 **multiply 2-, 3-, and 4-digit numbers by a 1-digit number with regrouping**

STRATEGY 1: Prepare and distribute squared material (ten strips and ones). Say, "Show three sets of 18." Write on the chalkboard.

e.g.,

A)
$$\begin{array}{r l} 18 & \\ \underline{\times 3} & \\ 24 & (3 \times 8) \\ \underline{30} & (3 \times 10) \\ 54 & \end{array}$$

B)
$$\begin{array}{r} \overset{2}{1}8 \\ \underline{\times 3} \\ 54 \end{array}$$

Ask a student to write the product for 3 x 8. (24) Ask another student to write the product for 3 x 10. (30) Ask a third student to add.

Say, "We can use a shorter method to find the products." Write example B next to example A on the chalkboard. Say, "What is the product of 3 x 8? (24) Regroup the 24. Place the 4 in the ones place and the 2 tens above the 1 ten to show regrouping. What is 3 x 1 ten? (3 tens) How many tens are regrouped with the 3 tens? (2 tens) 3 tens + 2 tens = 5 tens. Place the 5 in the tens place." Ask the students to compare the products in example A and B. Say, "The products are the same because the factors were the same."

Extend this procedure to the multiplication of 3- and 4-digit numbers.

STRATEGY 2: Prepare and distribute squared material. Say, "Use the material to show three groups of 15. How many

STRATEGY 2: cont'd

ones do we have? (15) Exchange 10 ones for one ten. How many tens do we have? (4) How much are 4 tens plus 5 ones? (45) We can show this arrangement as a multiplication example." Write $\begin{array}{r}15\\ \underline{x3}\end{array}$ on the chalkboard. Ask a student to come to the chalkboard and multiply 5 x 3. Say, "Write the five in the ones place and regroup the 10 ones as 1 ten. Place the 1 in the tens place." Demonstrate at the chalkboard. Say, "How much is 3 x 1? (3) ...plus one?" (4) Write the 4 in the tens place. Extend this procedure through multiplication of 3- and 4-digit numbers.

4.04.05.04 **solve word problems related to skills learned in this module**

STRATEGY 1: Write the following problem on the chalkboard.

> In one school, there are 31 children in each 4th grade class. How many children are in 5 classes?

Say, "What operation can we use to solve this problem?" (multiplication) Write the following multiplication example on the chalkboard.

e.g.,

$$\begin{array}{r}31\\ \underline{x5}\end{array}$$

Ask a student to do the multiplication at the chalkboard and label the answer. Use other problems with numbers through 4-digits.

STRATEGY 2: Write the following problem on the chalkboard.

> A high school football team scored 27 touchdowns in one season. If each touchdown counts as 6 points, how many points were scored?

Say, "What operation do we use to solve this problem?" (multiplication) Ask a student to solve the problem and label the answer.

Continue this procedure using other problems with numbers through 4-digits.

P.O. 4.04.03.01

NAME: ______________________ CLASS: __________ DATE: ________

Solve the problem. Use the secret code to find the message.

$$\begin{array}{r} 20 \\ \times 2 \\ \hline \end{array} \quad \begin{array}{r} 300 \\ \times 3 \\ \hline \end{array} \quad \begin{array}{r} 4000 \\ \times 4 \\ \hline \end{array} \quad \begin{array}{r} 50{,}000 \\ \times 5 \\ \hline \end{array}$$

$$\begin{array}{r} 60 \\ \times 6 \\ \hline \end{array} \quad \begin{array}{r} 700 \\ \times 7 \\ \hline \end{array} \quad \begin{array}{r} 8000 \\ \times 8 \\ \hline \end{array} \quad \begin{array}{r} 10 \\ \times 4 \\ \hline \end{array}$$

$$\begin{array}{r} 90{,}000 \\ \times 9 \\ \hline \end{array} \quad \begin{array}{r} 200 \\ \times 8 \\ \hline \end{array} \quad \begin{array}{r} 3000 \\ \times 7 \\ \hline \end{array} \quad \begin{array}{r} 40{,}000 \\ \times 6 \\ \hline \end{array}$$

4,900	810,000	250,000	360	40
N	B	I	C	M

64,000	16,000	900	240,000	21,000	1,600
U	G	A	S	R	E

1	2	3	4	5

6	7	8	9	10	11	12

482

P.O. 4.04.03.02

NAME: ____________________ CLASS: __________ DATE: __________

Solve the problems. Draw a straight line from the problem to the correct product. The line will cross a letter Place the letters in the numbered boxes to find out what you are.

21
x 3

324
x 3

2,211
x 4

223
x 3

33
x 3

43
x 2

1243
x 2

212
x 4

3212
x 3

34
x 2

8,844 T

86 E

63 M

848 I

972 A

68 S

669 H

9636 U

99 G

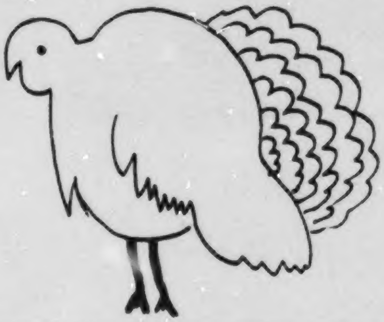
2486 N

____ ____ ____ ____   ____ ____ ____ ____ ____ ____
1 2 3 4   5 6 7 8 9 10

P.O. 4.04.03.03

NAME: ______________________ CLASS: __________ DATE: ________

1. Find each product.
2. Use the decoder to solve the riddle.



What country reminds you of Thanksgiving?

____

43 X 7 R	253 X 6 Y	2467 X 5 K
875 X 3 E	9768 X 2 T	638 X 4 U

Decoder:

_____ 19,536

_____ 2,552

_____ 301

_____ 12,335

_____ 2,625

_____ 1,518

P.O. 4.04.03.04

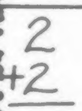
NAME: ______________________ CLASS: __________ DATE: ________

Solve each problem in the workspace.

1. During a candy sale, 9 students each collected $45.00. How much did they collect in all?

Workspace

2. Seven new swings for a playground each cost $62. What was the total cost?



3. William answered 27 questions on each part of a math test. If the test had 3 parts, how many questions did William answer?

4. Two children each delivered 130 newspapers. How many did they both deliver?

5. A school serves 536 lunches each day. How many lunches are served in a 5 day week?

6. A baseball stadium has 724 rows of reserved seats. If each row has 8 seats, how many reserved seats are there?

4.05.05 DIVISION OF 4-DIGIT DIVIDENDS BY 1-DIGIT DIVISORS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.05.05.01B divide a number through 9,999 by a 1-digit divisor and check using multiplication;

e.g.,

```
                    check
     4321           4321
    2)8642          x  2
                    8642
```

4.05.05.02B solve word problems related to skills learned in this module.

e.g.,

Adam has 1,860 marbles. He wants to divide them into 7 boxes. How many marbles will be in each box? There will be 266 marbles in each box.

```
                  266
                7)1862
200 x 7          -1400
                   462
 60 x 7           -420
                    42
  6 x 7            -42
                     0
```

4.05.05

VOCABULARY

TERMS

divisor
quotient
dividend
remainder

GETTING STARTED

Prepare two sets of index cards, one set with 1000 and its multiples, and one set with the digits 0 through 9. Divide the class into two teams. Ask one student to choose a card from each pile and use these numbers to write a multiplication example on the chalkboard.

e.g.,

$\boxed{2000}$ $\boxed{3}$ 2000 x 3 =

Team B has 10 seconds to get the correct answer. If they do, they get a point and a chance to pick the cards. If they miss, team A goes again. Continue play until one team has ten points.

Prepare a set of cards with division facts. Play "Division Baseball". Divide the class into two teams. Designate the chalkboard home and three corners of the room as first, second and third base. Team A is up at bat first. Show the first person on the team a card, e.g., 81 ÷ 9 If the student gets the correct answer, he/she goes to first base. The next student takes a turn, and students advance a base for each correct answer. If an answer is incorrect, the team gets an out. After three outs, Team B has a turn. Play continues for nine innings.

4.05.05

4.05.05.01 divide a number through 9,999 by a 1-digit divisor and check using multiplication

STRATEGY 1: Write the following example on the chalkboard.

e.g.,

$$3\overline{)3639}$$

Ask a student to write 3639 in expanded form.

e.g.,

$$3\overline{)3000 + 600 + 30 + 9}$$

Say, "How many groups of 3 are in 3000?" (1000) Write 1000 in the quotient. Say, "How many groups of 3 are in 600?" (200) Continue to write student responses in the quotient. Say, "How many groups of 3 are in 30? (10) How many groups of 3 are in 9?" (3)

e.g.,

$$\begin{array}{r} 1000 + 200 + 10 + 3 \\ 3\overline{)3000 + 600 + 30 + 9} \end{array}$$

Ask a student to add all of the numbers in the quotient to find the answer. (1213) Say, "We can check our answer. Multiply the quotient by 3. If the product matches the dividend it is correct." Write the following on the chalkboard.

e.g.,

$$\begin{array}{r} 1213 \\ \underline{\times \quad 3} \end{array}$$

Ask a student to complete the multiplication.

Continue this procedure and include examples with regrouping.

STRATEGY 2: Write the following example on the chalkboard.

e.g.,

$$5\overline{)6550}$$

Say, "Pretend we have 6550 cartons to deliver to 5 stores. We want to make sure each store gets an equal amount. What is the greatest number of thousands each store could get? (1) Where should we

STRATEGY 2:
cont'd

record the 1? (thousands place) If each store receives 1 thousand, how much should we take out?" (5000) Write the following on the chalkboard.

e.g.,

$$\begin{array}{rr} & \underline{1} \\ & 5\overline{)6550} \\ 5\text{x}1000 \longrightarrow & -\underline{5000} \\ & 1550 \end{array}$$

Say, "What is left? (1550) Can the thousands be shared equally? (no) Regroup 1 thousand as 10 hundreds. We have 15 hundreds. What is the greatest number of hundreds each store can receive? (3) Where should we record the 3? (hundreds place) If each store receives 300, how much should we take out?" (1500) Write the following on the chalkboard.

e.g.,

$$\begin{array}{rr} & \underline{13} \\ & 5\overline{)6550} \\ 5\text{x}1000 \longrightarrow & -\underline{5000} \\ & 1550 \\ 5\text{x}300 \longrightarrow & -\underline{1500} \\ & 50 \end{array}$$

Say, "What is left? (50) What is the greatest number of tens each store could receive? (1) Where should we record the 1? (tens place) If each store receives 1 ten, how much should we take out?" (50) Write the following on the chalkboard.

e.g.,

$$\begin{array}{rr} & \underline{1310} \\ & 5\overline{)6550} \\ 5\text{x}1000 \longrightarrow & -\underline{5000} \\ & 1550 \\ 5\text{x}300 \longrightarrow & -\underline{1500} \\ & 50 \\ 5\text{x}10 \longrightarrow & -\underline{50} \\ & 0 \end{array}$$

4.05.05

STRATEGY 2: cont'd

Say, "What is left? (0) Are there ones to divide? (no) How can we show this? (Place a zero in the ones place.) How many cartons did each store get? (1310) We can check this example by multiplication." Write the following on the chalkboard.

e.g.,

$$\begin{array}{r} 1310 \\ \underline{\times \quad 5} \\ 6550 \end{array}$$

Say, "The product and the dividend are the same. Therefore, we know we are right."

Continue this procedure using other numbers.

4.05.05.02 **solve word problems related to skills learned in this module**

STRATEGY 1: Write the following problem on the chalkboard.

> Lorraine has 1,940 stamps in her collection. She wants to place them in 5 stamp albums. How many stamps will be in each album?

Say, "What type of problem is this?" (division) Ask a student to do the division and check the answer by multiplication.

Continue this procedure using other problems.

STRATEGY 2: Write on the chalkboard.

> Steve planted a garden. He harvested 1,251 tomatoes from 9 tomato plants. Each plant had the same number of tomatoes on it. How many tomatoes grew on each plant?

Ask a student to choose the correct operation to solve the problem and using good problem solving techniques, solve, check by multiplication, and label the answer.

184

P.O. 4.05.05.01

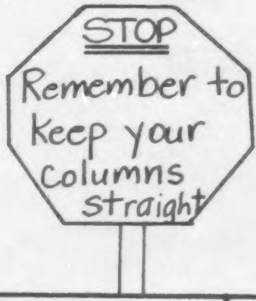
NAME:____________________________________ CLASS:_________ DATE:_______

Solve by using long division. Check using multiplication.

```
      211
5) 1055
   1000
     55
     50
      5
      5
      0
```

Check

```
  211
x   5
 1055
```


STOP
Remember to keep your columns straight

3) 3896

Check

2) 128

Check

8) 6488

Check

6) 9466

Check

7) 7764

Check

4) 5972

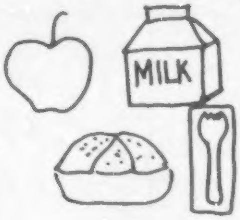
Check

P.O. 4.05.05.02

NAME: ________________________ CLASS: __________ DATE: ________

Solve each problem.

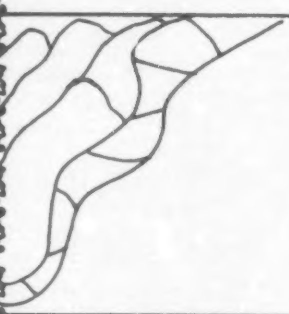
1. A parking lot holds 848 cars. There are 4 cars in a row. How many rows of cars are there?



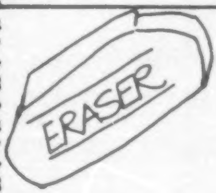
2. A school serves 1640 lunches a day. There are 2 lunch hours each day. How many lunches are served each lunch hour?

3. P.S. 729 bought 3784 books for its students. Each student received 7 books.

a. How many students received books?
b. How many books were left over?



4. A group planned to hike up a trail in 5 hours. The trail was 8100 meters long. About how many meters per hour would they climb?



5. Stanley wants to buy 30 erasers. The erasers cost 12¢ each. Stanley has $3.00. Does he have enough money to buy the erasers?

Unit 49

4.10.06 MEASUREMENT - TEMPERATURE

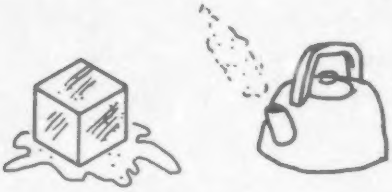
(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

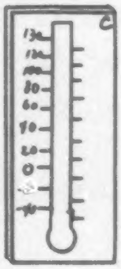
4.10.06.01 read and locate the degrees for the freezing point of water (32°F), the boiling point of water (212°F), and normal body temperature (98.6°F) on a Fahrenheit thermometer;

e.g.,



4.10.06.02 read and locate the degrees for the freezing point of water (0°C), the boiling point of water (100°C) and normal body temperature (37°C) on a Celsius thermometer.

e.g.,



VOCABULARY

TERMS	SYMBOLS
Fahrenheit	F
Celsius	C
degree	°
freezing point	
boiling point	
body temperature	

GETTING STARTED

Divide the class into small groups. Distribute a pan of ice water, a pan of warm water and a thermometer to each group. Say, "Place the thermometer into the pan of ice water. Watch the column of liquid." Discuss what happens. Say, "Place the same thermometer in the warm water." Discuss what happens to the column of liquid compared with what happened in the ice water. Elicit from the students that the column of liquid gets longer as it gets warmer, and shorter as it gets cooler.

Place a pan of warm water, a pan of cold water, and a pan of ice water in the front of the classroom. Ask two students to place their fingers in the warm water. Ask each student to describe how it feels. Repeat this procedure using the cold water and ice water. Say, "Things feel different to different people, therefore, feelings are not efficient temperature indicators. Thermometers are used to measure temperature more efficiently. The standard unit for measuring temperature is degree; the symbol for degree is (°)." Examine different types of thermometers. Have students draw conclusions from their observations, e.g., different thermometers have different scales. Some thermometers measure very high temperatures and other thermometers measure very low temperatures.

4.10.06

4.10.06.01 **read and locate the degrees for the freezing point of water (32°F), boiling point of water (212°F), and normal body temperature (98.6F) on a Fahrenheit thermometer**

STRATEGY 1: Prepare a Fahrenheit thermometer for demonstration and blank replicas of thermometers for students.

Walk around the room and show the thermometer to the students. Note the markings on the scale. Say, "The freezing point of water is 32°F. The boiling point is 212°F and normal body temperature is 98.6°F."

Distribute copies of the thermometer. Ask the students to mark 32°, 212° and 98.6°.

STRATEGY 2: Prepare a large Fahrenheit ribbon thermometer.

Write the following information on the chalkboard.

Freezing point 32°F
Boiling point 212°F
Normal body temperature 98.6°F

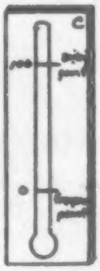
Ask different students to use the ribbon thermometer, and locate and read the number of degrees for the freezing point of water, the boiling point of water and normal body temperature.

4.10.06.02 **read and locate the degrees for the freezing point of water (0°C), boiling point of water (100°C) and normal body temperature (37°C) on a Celsius thermometer**

4.10.06

STRATEGY 1: Provide each student with a copy of a thermometer and a centimeter ruler.

e.g,



Say, "The freezing point of water on a Celsius thermometer is 0°C. Mark the freezing point 0 on your thermometer. Use the centimeter ruler to measure a distance of 10 centimeters from 0. Mark the point at ten centimeters, 100°, to indicate the boiling point of water. Divide the segment from 0 to 100 into equivalent parts. Draw horizontal lines to show that the segment is divided into 10 parts. Indicate 10 degree intervals by marking the first line above zero, 10, the next 20, through 100. Each 10 degree unit can be further divided into 10 equal parts. Say, "What are the marks between the centimeters on your ruler called? (millimeters) How many millimeters would there be between 0 and 10 on your scale? (10) Mark your temperature scale in millimeter divisions. Locate the temperature reading for normal body temperature which is 37°C. Mark that point."

STRATEGY 2: Adapt Strategy 2 used in P.O. 4.10.06.01.

P.O. 4.10.06.01

NAME: ______________________________ CLASS: ________ DATE: ________

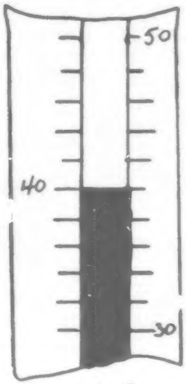
I. Answer the following questions.

II. Read each thermometer. Indicate if the temperature is above the freezing point.

1. What temperature Fahrenheit does water freeze? ________
2. At what temperature Fahrenheit does water boil? ________
3. John's temperature is 103°F. Is John's body temperature normal or does he have a fever? ________
4. The temperature is 10 F. Would you ice skate or water ski? ________
5. The temperature is 80° F. Will it snow or rain? ________

---

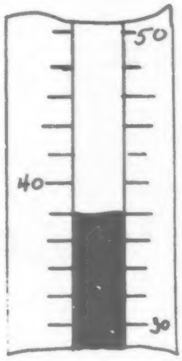
e.g.



40°

above the freezing pt.

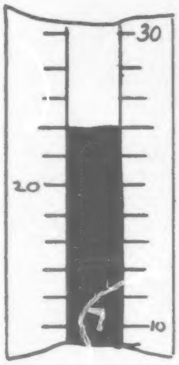
6.



____°

____

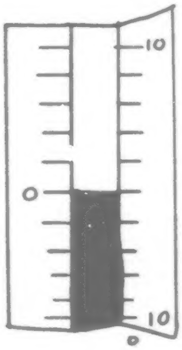
7.



____°

____

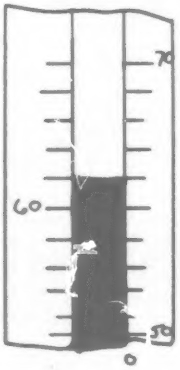
8.



____°

____

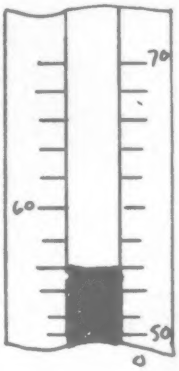
9.



____°

____

10.



____°

____

P.O. 4.10.06.02

NAME:________________________________ CLASS:__________ DATE:________

Fill in the blank with Hot or Cold.

1 The temperature is 40°C outside.

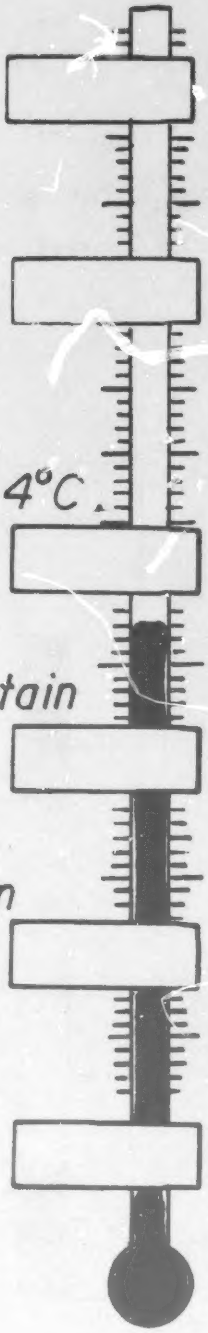
2 The temperature in a house is 10° C.

3 The temperature of a cup of coffee is 4°C.

4 The temperature at the top of a mountain is 8°C.

5 The temperature at a baseball stadium is −8°C.

6 The temperature outside is 9°C. Will the skating pond freeze?



4.08.01 INTEGERS

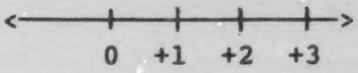
(2-3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

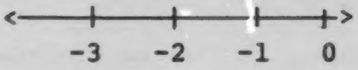
4.08.01.01B identify a positive number as a number which appears to the right of zero on a number line;

e.g.,



4.08.01.02B identify a negative number as a number which appears to the left of zero on a number line;

e.g.,



4.08.01.03A identify situations when negative and positive numbers may be used;

e.g.,

Money saved - use positive numbers;
Money spent - use negative numbers;
Yards gained and lost in a football game.

4.08.01.04A solve word problems related to skills learned in this module.

e.g.,

The temperature was 5° above zero but went up 3°. What is the temperature now?

4.08.01

VOCABULARY

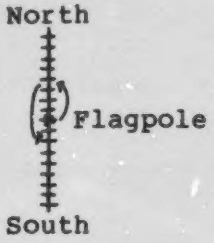
TERMS	SYMBOLS
integers	+1, -1
positive number	+n
negative number	-n

GETTING STARTED

Say, "Was it cold yesterday! The temperature was eight degrees during the day and then it dropped ten degrees at night. Do you think it was warmer or colder at night?" Continue this procedure asking the students to determine relative temperature without using computation.

Say, "Mary followed a treasure map. It said start at the flagpole. Walk three steps north. About face. Walk five steps south. Where will Mary be in relation to the flagpole?" (Two steps south of the flagpole.)

Draw this diagram on the chalkboard.



Continue this procedure.

194

4.08.01

4.08.01.01 **identify a positive number as a number which appears to the right of zero on the number line**

STRATEGY 1: Write the following statements on the chalkboard.
e.g.,

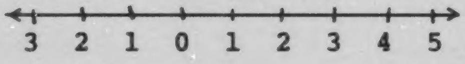
A) The temperature is 2°? (above or below zero)
B) What does $2 mean in my bank book? (deposit or withdrawal)

Say, "There are times when we must use a + sign to show the meaning of a number. This symbol tells us that the number is greater than zero and it is called a positive number."

Write the following numbers on the chalkboard and ask the students to circle the positive numbers.
e.g.,

0, +2 , +6 , -3, +3

STRATEGY 2: Draw a number line on the chalkboard.
e.g.,



Ask the students to point to 2. Say, "There are 2 twos on the number line. The two I am thinking of is greater than zero. The numbers to the right of zero are larger than zero. We call them positive numbers and use a + sign to show that they are greater than zero." Ask the students to sign the positive numbers on the line. Ask the students to find +3 and +1 on the number line.

4.08.01.02 **identify a negative number as a number which appears to the left of zero on a number line**

STRATEGY 1: Say, "We use a minus sign to show that a number is less than zero. We call a number with a minus sign a negative number." Ask the students to circle the negative numbers written on the

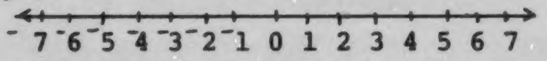
4.08.01

STRATEGY 1: cont'd

chalkboard.
e.g.,
0, +2, -2 , 6, +6, -6 , +3, 3, -3

STRATEGY 2:

Draw a number line on the chalkboard.
e.g.,



Ask the students to identify the positive numbers. Say, "The numbers on the left are less than zero. We call them negative numbers and use a minus sign to show that they are smaller than zero." Ask the students to find -6, -4, -3 and -5 on the number line.

4.08.01.03 **identify situations when negative and positive numbers may be used**

STRATEGY 1:

Display the following chart on the chalkboard.
e.g.,

Diet Chart

Original Weight	Week 1	Week 2	Week 3
John 75	-3	0	+1
Barry 72	-2	-4	+2
Henry 77	-2	+3	-4

Say, "John, Barry and Henry went on a diet. They kept the following chart." Point to the chart. Say, "Did John gain or lose weight in week 1? (lost) How can we tell? (use of a negative number) How much weight did he lose? What about week 2? ...week 3?" Continue this procedure for the other two boys. Say, "We use positive and negative numbers to identify many situations."

Continue this procedure using other charts.

4.08.01

STRATEGY 2: Ask the students to bring in newspaper articles that use negative and positive numbers.

e.g.,

a) stock market reports
b) the listings of temperatures in various cities
c) football - yards gained and lost during a game

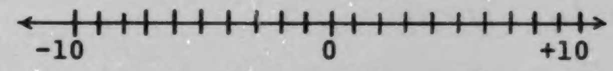
Use the articles to determine gains or losses.

4.08.01.04 **solve word problems related to skills learned in this module**

STRATEGY 1: Display the charts drawn in Strategy 1 of P.O. 4.08.01.03. Refer to the weight chart and say, "What happened to John in week 1? (he lost 3 lbs., -3) Who lost the most weight in week 2? (Barry) What happened to Henry in week 3?" (He lost 4 lbs.)

STRATEGY 2: Ask the students to draw a number line from -10 to +10 and sign all of the numbers.

e.g.,



Ask the students to use the number line to mark off the answers to the following problems.

e.g.,

a) The temperature was 5° above zero, but went up 3°. What is the temperature now?
b) The team lost 4 yards on the first down. On the second down they gained 3 yards. How much do they need to make a first down? (if 10 yards = a first down)

P.O. 4.08.01.01

NAME: ______________________________ CLASS: __________ DATE: ________

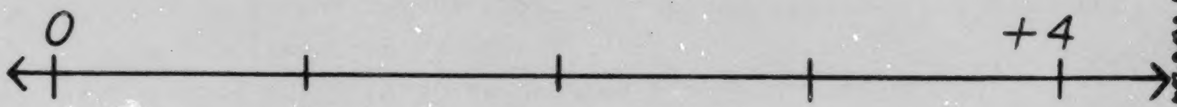
WRITE THE SIGNED NUMBER TO SHOW . . .

The temperature is 16 above zero. ______

The stock market went up 32 points. ______

I made a deposit of $\$23^{00}$ ______

COMPLETE THE NUMBER LINE



WRITE THE SIGNED NUMBER

4 greater than zero. ______

3 steps to the right of zero. ______

2 greater than zero.

5 steps to the right of zero. ______

1 greater than zero. ______

9 steps to the right of zero. ______

25 greater than zero. ______

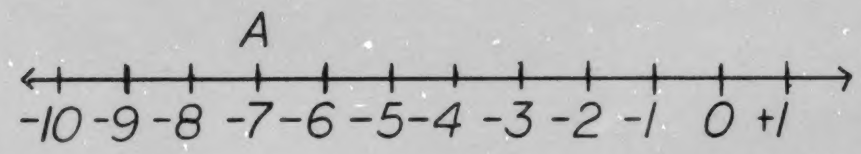
100 steps to the right of zero. ______

238 greater than zero. ______

P.O. 4.08.01.02

NAME:______________________________ CLASS:__________ DATE:________

Place the letters on the number line.


A
-10
-9
-8
-7
-6
-5
-4
-3
-2
-1
0
+1

Put A at −7

Put E at −9 and −3

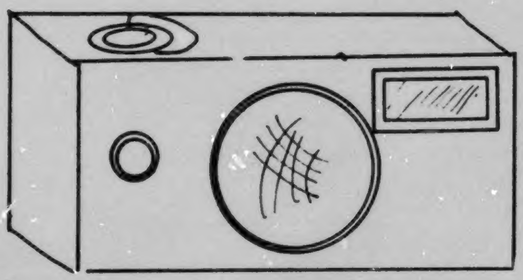
Put G at −8

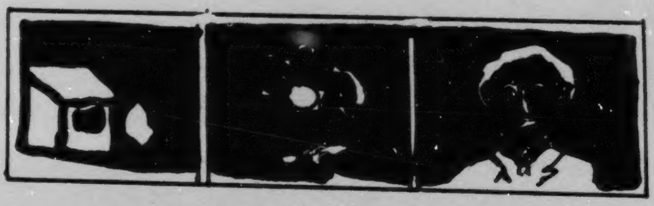
Put I at −5

Put N at −10

Put T at −6

Put V at −4





P.O. 4.08.01.03

NAME: ______________________________ CLASS: ________ DATE: _______

Write the positive or negative number.

The stock market went down 7 points. ____

The temperature is 10° above 0. ____

The team gained 2 yards on the first down. ____

Mary gained 7 pounds on her diet. ____

I earned $26.00. ____

I lost 36.00. ____

The team lost 7 yards on the next down. ____

We live 200 feet above sea level. ____

John lost ten pounds. ____

The temperature is 20° above 0. ____

The government spent $3000 more dollars than it earned ____

The club showed a profit of $700 from the cookie sale. ____

The lake is 300 ft below sea level. ____

The temperature is 8° below zero. ____

The stock market went up 2 points. ____

200

P.O. 4.08.01.04

NAME: ____________________ CLASS: ________ DATE: _______

Use the chart to answer the questions.
Use signed numbers to fill in the blanks.

DIET CHART

ORIGINAL WEIGHT		WEEK 1	WEEK 2	WEEK 3
John	75	-3	0	+1
Barry	72	-2	-4	+2
Henry	77	-2	+3	-4

1 Did John lose or gain weight in week 1?
How much? _____

2 Did John lose or gain weight in week 2?
How much? _____

3 Did Barry lose or gain weight in week 1?
How much? _____

4 Did Henry lose or gain weight in week 2?
How much? _____

5 What was the total weight loss
In week 1? _____
In week 2? _____
In week 3? _____

4.12.03 ARRANGEMENTS

(1 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

4.12.03.01B identify all the possible arrangements for a group of objects;

e.g.,

apple, banana, orange

abo, aob, bao, boa, oab, oba

4.12.03.02B solve word problems related to skills learned in this module.

e.g.,

Mary has two pairs of pants, red and blue. She has three shirts, white, blue and gray. How many different outfits can she make?

red pants white shirt
red pants blue shirt
red pants gray shirt

blue pants white shirt
blue pants blue shirt
blue pants gray shirt

She can make 6 different outfits.

4.12.03

VOCABULARY

TERMS

arrangement
ordering

GETTING STARTED

Say, "Mother is receiving new living room furniture and wants us to help her arrange it. There are two small couches, a chair, two tables and a lamp. What is one possible arrangement? (place the two couches together, place the tables at either end, and the lamp next to a table) How many different arrangements can be made? (many) Will the pieces of furniture change as we rearrange them?" (No, the furniture will still be the same.)

Distribute colored rods to students. Say, "Let's place the red rod first, the yellow rod second, and the purple rod last. Is there any other way that we can arrange the rods? (two other ways) When we have a group of objects, we can order them in a number of ways, without changing the objects."

4.12.03

4.12.03.01 **identify all the possible arrangements for a group of objects**

STRATEGY 1: Prepare and distribute colored rods. Say, "Let's make a train of green, yellow, blue, orange." Write g, y, b, o on the chalkboard. Say, "Is there any other way to arrange the train?" e.g., yellow, green, blue, orange. Write y, g, b, o on the chalkboard. Repeat this procedure until all the possible combinations for the rods have been made.

STRATEGY 2: Say, "The class went to the circus. There were three rings. The bears were in one ring, the clowns were in the center ring and the acrobats in the third ring." Write the following on the chalkboard.

e.g.,

Bears Clowns Acrobats

Say, "They switched places. The circus leader rearranged them." Write a new order on the chalkboard.

e.g.,

Clowns Bears Acrobats

Say, "If you were the circus leader, how might you rearrange the three groups?" Ask individual students to come to the chalkboard and rearrange the groups. Use letters a, b, c, for acrobat, bear, clown, to show the different arrangements.

204

4.12.03

4.12.03.02 solve word problems related to skills learned in this module

STRATEGY 1: Prepare a flannel board and cutouts of a banana, apple and an orange. Write the following problem on the chalkboard.

> Mother is preparing a fruit basket and wants us to help her. How many ways can she arrange the fruit?

On a felt board, show a cutout of a banana, apple and orange. Ask students to come to the felt board to rearrange the "fruit". Write their arrangements on the chalkboard.

e.g.,

banana, apple, orange
banana, orange, apple
apple, orange, banana
orange, apple, banana
orange, banana, apple

STRATEGY 2: Write the following problem on the chalkboard.

> Mildred had a red scarf, blue scarf, yellow scarf and a white shirt. How many different outfits can she wear?

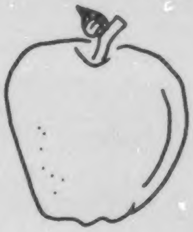
At the felt board show red, blue, yellow cutouts to represent the scarves and a white cutout to represent the shirt. Ask students to come to the felt board to show all the arrangements that can be made.

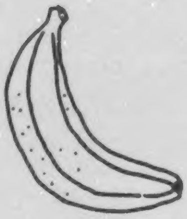
Repeat this procedure using other colors.

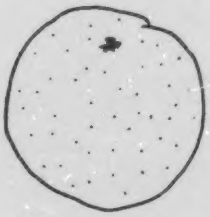
P.O. 4.12.03.01

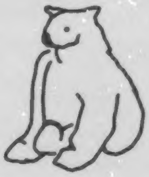
NAME: ______________________ CLASS: __________ DATE: ________

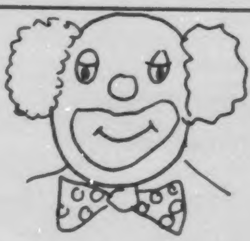
Show all the possible arrangements.

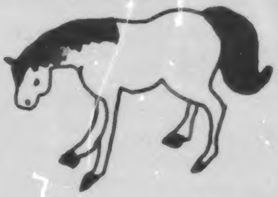


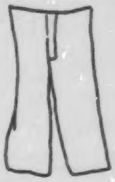


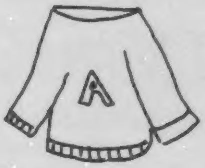


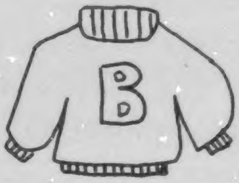


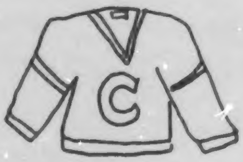












P.O. 4.12.03.02

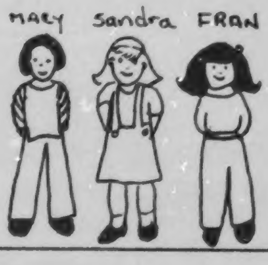
NAME: ______________________ CLASS: __________ DATE: __________

Solve each problem.

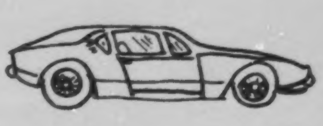
A) Guy had 3 pair of socks in his dresser drawer. He placed them in the drawer this way: brown, blue, green. How many other ways can he place the socks?

B) Sylvia arranged a cookie, brownie, a cupcake in a row at the cake sale. How else might she place them?

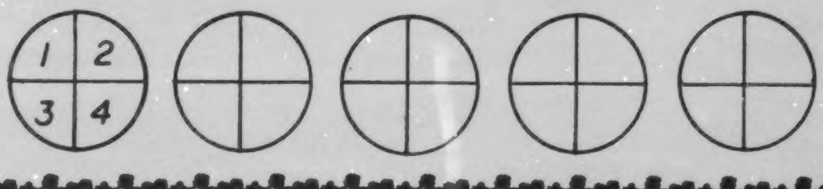
C) Mary is first on line, Sandra is second, Fran is third. Rearrange the girls in line as many ways as you can.



D) The red car was parked in front, than the black car then the green car. How can you place these cars so that the red won't always be in front?



E) This spinner has 4 numbers. Can you rearrange the numbers. Can you re-arrange the numbers on other spinners?



4.13.04 PROBLEM SOLVING - PATTERNS

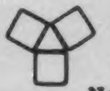
(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.13.04.01A identify and extend patterns involving geometric shapes;

e.g.,



No. of △	1	2	3	4
No. of □	3	6	9	...

4.13.04.02A locate patterns on a calendar;

e.g.,

S	M	T	W	Th	F	S
		1	2	3	4	5
6	7	8	9	10	11	12

Can you locate a vertical pattern?

Can you locate a diagonal pattern?

Can you locate other patterns?

4.13.04.03A locate patterns on a chart/table.

e.g.,

+	0	1	2	3
0	0	1	2	3
1	1	2	3	4
2	2	3	4	5

table A

x	0	1	2	3
0	0	0	0	0
1	0	1	2	3
3	0	3	6	9

table B

Can you locate a vertical pattern?

Can you locate a horizontal pattern?

Can you locate a diagonal pattern?

Find the sum of the digits and look for patterns.

4.13.04

VOCABULARY

TERMS

vertical
diagonal
horizontal
pattern

GETTING STARTED

Write the following number sequence on the chalkboard.

e.g.,

1, 3, 5, 7, 9, ___, ___, ___

Ask the students to figure out the pattern and complete the sequence.

Continue with other number sequences.

Prepare and distribute pattern blocks. Draw a pattern on the chalkboard.

e.g., □ △ △ □ □ △ △ △ ___ ___ ___

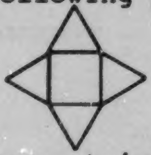
Ask the students to use their blocks, copying the pattern and completing it.

Ask different students to develop patterns for other students to complete.

4.13.04

4.13.04.01 **identify and extend patterns involving geometric shapes**

STRATEGY 1: Place the following pattern on the chalkboard.
e.g.,



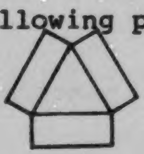
Say, "What geometric figures do you see in the first picture? (triangles and squares) How many triangles? (4) ...squares? (1) Let's make a chart to see the number of triangles and rectangles we would have if we kept drawing the figure." Draw the following chart on the chalkboard.
e.g.,

No. of △	4	8	?	16
No. of □	1	2	3	?

Say, "How many triangles for one rectangle? (4) ...two rectangles? (8) How many rectangles will we use if we have 16 triangles? Do you see a pattern for the number of triangles and rectangles?"

Repeat this procedure using other patterns.

STRATEGY 2: Draw the following picture on the chalkboard.
e.g.,



Say, "Look at the picture on the chalkboard. Count the number of triangles. Count the number of rectangles." Draw a chart under the picture on the chalkboard.
e.g.,

No. of △	1
No. of ▭	3

Say, "Draw another figure like the first one. It does not have to be perfect. How many triangles do

STRATEGY 2: cont'd

we have? (2) ...squares? (6) Fill in the the chart."

e.g.,

No. of △	1	2
No. of ▭	3	6

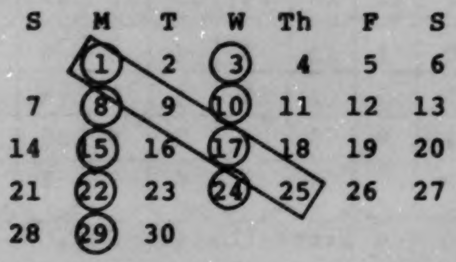
Say, "Without drawing anymore figures, how many rectangles would you have if there were three triangles? (9) Do you see a pattern of triangles and rectangles? What pattern do you see?"

Continue this procedure using other patterns.

4.13.04.02 **locate patterns on a calendar**

STRATEGY 1: Prepare and distribute copies of a blank calendar. Say, "Fill in the calendar. Find today's date. What is the date one week from today?" Write today's date and the date one week from today on the chalkboard. Say, "What is the difference between today's date and next week's date? (7) Find the differences between all of the Tuesday dates. (7) Look at the Monday column. What do you notice? Look at Wednesday's column. What patterns do you notice? Look at the dates diagonally. Take a ruler and place it diagonally across the first Monday. Draw a line through the next three dates diagonally. What pattern do you see? (increased by eight) Try to discover other patterns."

e.g.,



S	M	T	W	Th	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

4.13.04

STRATEGY 2: Prepare and distribute unfinished copies of a calender with only certain dates filled in.

e.g.,

S	M	T	W	Th	F	S
1		3	4		6	
		10		12		14
15	16					21
22				26	27	
	30	31				

Say, "If today is Tuesday the third, what date will next Tuesday be? ...the following Tuesday? How do you know? (Since there are 7 days between each day of the week, we add 7 to each date to find the date of the next week.) Look at Wednesday's column. Can you fill in the date for all the Wednesdays of the month?"

e.g.,

W
4
11
18
25

Repeat this procedure to find other patterns until the calender is completed.

4.13.04.03 **locate patterns on a chart/table**

STRATEGY 1: Prepare and distribute a hundreds chart, an addition table and demonstration models to each student.

e.g.,

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

+	0	1	2	3	4	5	6	7	8	9	10
0	0	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10	11
2	2	3	4	5	6	7	8	9	10	11	12

Point to the first chart. Say, "Look at the first vertical column. What patterns do you see in the first column? (one in the ones column) Look at the

STRATEGY 1: cont'd

other vertical columns. What do you notice? (All of the numbers have the same number in the ones place.) Place a ruler along the diagonal of the chart beginning with one." Demonstrate on the model.

e.g.,

1	2	3	4	5
11	12			
21		23		

Say, "Write the sequence of numbers that lie on the diagonal. (1, 12, 23...) What pattern do you see?" (Each number is increased by 11.)

Repeat this procedure with other charts and tables.

STRATEGY 2: Prepare and distribute a hundreds chart as shown below.

e.g.,

1	2	3	4	5	6	7	8	9	10
11	12	13						19	20
		23					28		
31			34			37			
				45	?				50
	52			?					60
		63	?						
71		73							
	82							89	
91								99	100

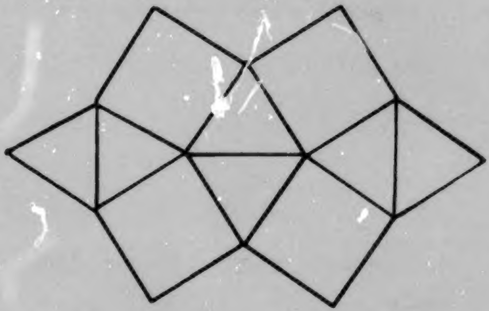
Say, "We are going to complete this chart by locating patterns. Look at the second row. Fill in the missing numbers. Look at column one and fill in the missing numbers. What pattern do you see? (Each number ends with one.) Look at the numbers that lie on the diagonal beginning with one. Do you see a pattern? Complete the chart by finding different patterns."

Repeat this procedure using other tables.

P.O. 4.13.04.01

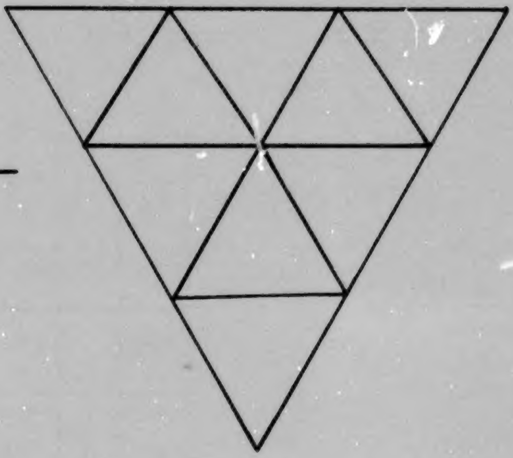
NAME: ____________________ CLASS: ________ DATE: ________

Count the number of □ and △ in each figure. Try to extend each figure by adding □ 's and △ 's. When you're finished, you may color the figures.

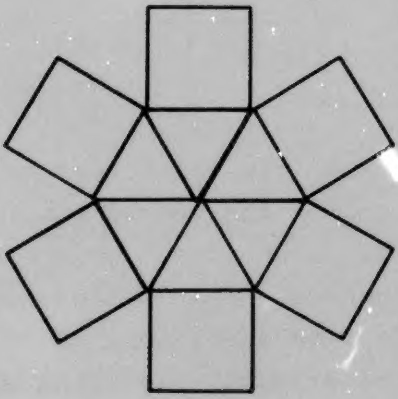


No. of △ ______

No. of □ ______



No. of △ ______



No. of □ ______

No. of △ ______

P.O. 4.13.04.02

NAME: ____________________ **CLASS:** ________ **DATE:** ________

Using the calendar, write patterns.
Complete the sequence filling in the blanks.

AUGUST 1982

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

1. List all the dates for Sunday in this month.
   answer: 1, 8, 15, 22, 29

2. Write the next four dates that would appear if there were no limits to the days in this month.
   1, 8, 15, 22, 29, ____, ____, ____, ____.

3. List all the Saturdays in the month.
   answer: ____________________

4. What rule could you apply to the dates found on Saturday?

	Rule
7	?
14	?
21	?
28	?
	?

Complete the patterns using the calendar.

5. 1, 9, 17, 25, 33, 41
6. 5, 11, 17, ____, ____, ____.
7. 7, 13, 19, ____, ____, ____.
8. 6, 13, 20, ____, ____, ____.
9. 30, 24, ____, ____, ____.

P.O. 4.13.04.03

NAME: ______________________ CLASS: ________ DATE: ______

Fill in the chart.
Use the chart to answer the questions.

X	0	1	2	3	4	5	6	7	8	9
0	0	0	0	0						
1	0	1	2							
2	0	2		6						
3	0	3						21		
4	0									
5	0		10							
6	0									54
7	0	7								
8	0	8		24						
9	0	9	18							81

1. Complete the chart by filling in the blank boxes.

2. List the numerals for the vertical pattern of the 1's column.

____

3. List the numerals for the horizontal pattern of the row that is marked 3. ______________________________

4. What pattern do you see for each vertical column?

____

5. What pattern do you see for each horizontal row?

____

6. Starting at zero, write the pattern for the diagonal of the chart.

____

7. Starting at nine, write the pattern for the diagonal of the chart.

____

8. What pattern do you see when you look at the diagonal beginning at nine? ______________________________

4.06.06 COMMON FACTORS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.06.06.01B find the common factors of several whole numbers less than 100;

e.g.,

18 and 24

The factor set for 18 is {1,2,3,6,9,18}

The factor set for 24 is {1,2,3,4,6,8,12,24}

Common factors are {1,2,3,6}

4.06.06.02A find the greatest common factor of a set of whole numbers;

e.g.,

12, 18, 24

The factor set for 12 is {1,2,3,4,6,12}

The factor set for 18 is {1,2,3,6,9,18}

The factor set for 24 is {1,2,3,4,6,8,12,24}

G.C.F. is 6

4.06.06.03A find the least common multiple of a set of whole numbers.

e.g.,

2, 3, 4

The set of multiples of 2 is {2,4,6,8,10,12...}

The set of multiples of 3 is {3,6,9,12,15,18,...}

4 is {4,8,12,16,20,24,...}

L.C.M. 2,3,4 is 12

4.06.06

VOCABULARY

TERMS	SYMBOLS
factor	
greatest common factor	GCF
multiple	
least common multiple	LCM

GETTING STARTED

Prepare and distribute a set of colored rods to each student. Say, "Take a brown rod and find all of the one color trains as long as the brown rod." Repeat this procedure for the blue rod, orange rod, black rod and dark green rod. Say, "Is there any rod which was used in all the trains?" (white rod)

Prepare a set of multiplication fact cards. Play "Multiplication Bee". Ask the students to stand. Show the first student a card. e.g.,

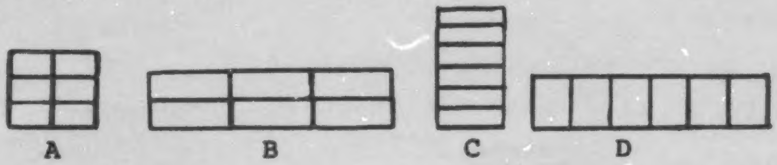
$$\boxed{\begin{array}{r}3\\ \underline{x5}\end{array}}$$

If the student answers correctly he remains standing. Play continues until only one student remains standing.

4.06.06

4.06.06.01 find the common factors of several whole numbers less than 100

STRATEGY 1: Prepare and distribute graph paper. Draw a graph on the chalkboard. Say, "We will represent numbers as rectangles. Draw a rectangle with six squares." e.g.,



Say, "Can any of the rectangles be turned to show another rectangle? (A can be turned to make B and C can be turned to make D.) We consider rectangles A and B to be the same. We do not need rectangle B. What other rectangle can we eliminate? (rectangle D) What are the factors that make rectangle A? (2 and 3) What are the factors that make rectangle C? (1 and 6) The factors of 6 are 1, 2, 3 and 6." Write this on the chalkboard. Ask the students to find the factors for other numbers.

STRATEGY 2: Prepare and distribute a multiplication chart through 9 x 9. Ask the students to find all of the eights in the chart and circle them.
e.g.,

x	$\boxed{1}$	$\boxed{2}$	3	$\boxed{4}$	5	6	7	$\boxed{8}$	9
$\boxed{1}$	1	2	3	4	5	6	7	⑧	9
$\boxed{2}$	2	4	6	⑧	10	12	14	16	18
3	3	6	9	12	15	18	21	24	27
$\boxed{4}$	4	⑧	12	16	20	24	28	32	36
5	5	10	15	20	25	30	35	40	45
6	6	12	18	24	30	36	42	48	54
7	7	14	21	28	35	42	49	56	63
$\boxed{8}$	⑧	16	24	32	40	48	56	64	72
9	9	18	27	36	45	54	63	72	81

STRATEGY 2: cont'd

Say, "Trace your fingers across the line for any eight that you circled. Draw a square around the number at the left of that line. Now trace your finger up to the top most row and put a square around that number. Continue for all the eights. The numbers in the square are the factors for eight." (1,2,4,8)

4.06.06.02 **find the greatest common factor of a set of whole numbers**

STRATEGY 1: Write the numbers 12, 18 and 24 on the chalkboard. Ask the students to find the factors for each.

e.g.,

The factor set for 12 is {1,2,3,4,6,12} .
The factor set for 18 is {1,2,3,6,9,18} .
The factor set for 24 is {1,2,3,4,6,8,12,24} .

Say, "Find the largest number that occurs in all three of the factor sets. (6) Six is called the Greatest Common Factor. The abbreviation for Greatest Common Factor is G.C.F." Ask the students to find the Greatest Common Factor for other sets of whole numbers.

STRATEGY 2: Ask the students to draw all of the arrays for 12.

```
                            xxxxxx   xxxx   xxx
e.g.,                       xxxxxx   xxxx   xxx
   xxxxxxxxxxxx                      xxxx   xxx
                                            xxx
```

Say, "What are the factors for 12?" Write the factors on the chalkboard. Repeat this procedure for 16 and 30.

e.g.,

The factors for 12 = {1,2,3,4,6,12} .
The factors for 16 = {1,2,4,8,16} .
The factors for 30 = {1,2,3,5,6,10,15,30} .

Say, "Which factors are common to all of the factor

STRATEGY 2: cont'd

sets? (1 and 2) Which factor is greater? (2) 2 is the Greatest Common Factor of 12, 16 and 30. We call 2 the GCF."

Repeat this procedure for other sets of numbers.

4.06.06.03 **find the least common multiple of a set of whole numbers**

STRATEGY 1: Distribute a 100 square to each student. Ask the students to fill in the chart. Say, "Draw a circle around all of the multiples of 6. Put a square around all of the multiples of 7. Name the numbers which have both a circle and a square around them. (42 and 84) 42 and 84 are called common multiples of 6 and 7. Which is the smallest multiple? (42) The smallest number which has both numbers as factors is called the Least Common Multiple or LCM."

Repeat this procedure for other pairs of factors.

STRATEGY 2: Ask the students to write the multiples of four through 40, the multiples of six through 60 and the multiples of three through 30. Write the following on the chalkboard.

The multiples of 4 are $\{4,8,12,16,20,24,28,32,36,40\}$.
The multiples of 6 are $\{6,12,18,24,30,36,42,48,54,60\}$.
The multiples of 3 are $\{3,6,9,12,15,18,21,24,27,30\}$.

Say, "Find the smallest number contained in all three sets. (12) 12 is the Least Common Multiple for 4, 6 and 3."

Repeat this procedure for other sets of numbers.

P.O. 04.06.06.01

NAME: ______________________ **CLASS:** __________ **DATE:** ________

Circle the factors for each number.
Complete the table.

12

1 5 7 6
2 8 4 9 11
10 3 2 12

10

1 3 2 5
10 8 9
4 6 10

16

1 5 4 10
2 6 9
8 16

15

1 6 15 8
7 5
16 9 3

24

1 14 6 12
8 5
16 3 7
4
2 9 24

18

1 2 9
3 4
18 6
7 5 11

Number	Factors
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

P.O. 04.06.06.02

NAME: ______________________ **CLASS:** __________ **DATE:** ________

Write the set of factors for each number.
Write the greatest common factor.

6 14 20

The set of factors for 6 = {______________}

The set of factors for 14 = {______________}

The set of factors for 20 = {______________}

The Greatest Common Factor is

20 16 32

The set of factors for 20 = {______________}

The set of factors for 16 = {______________}

The set of factors for 32 = {______________}

The Greatest Common Factor is

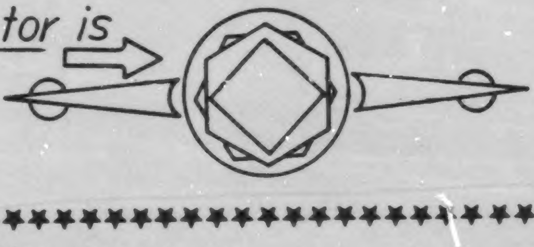
48 32 40

The set of factors for 48 = {______________}

The set of factors for 32 = {______________}

The set of factors for 40 = {______________}

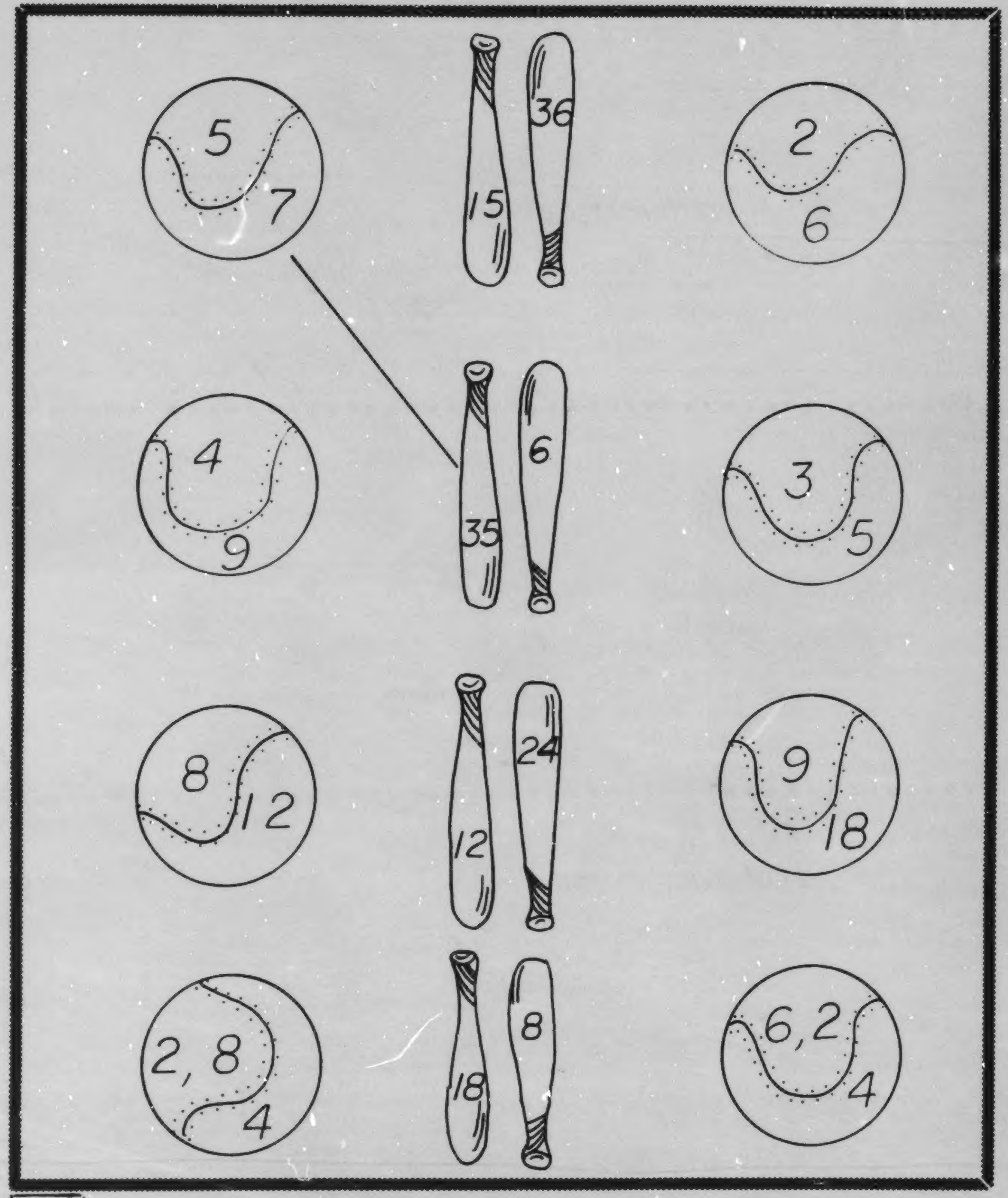
The Greatest Common Factor is



P.O. 04.06.06.03

NAME: ______________________________ CLASS: __________ DATE: ______

Match the least common multiple on the bat with the matching baseball.


5
7
15
36
2
6
4
9
35
6
3
5
8
12
12
24
9
18
2, 8
4
18
8
6,2
4

Unit 54

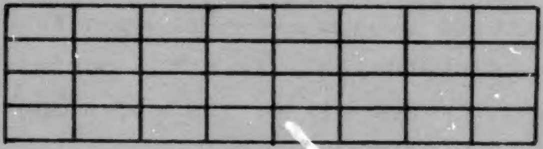
4.10.07 AREA

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

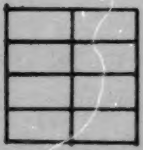
4.10.07.01A measure area using non-standard units; e.g.,



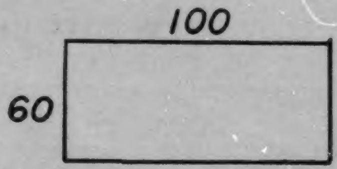
How many cubes will fill this area?

4.10.07.02A measure area using standard units; e.g.,

square inch
square foot



4.10.07.03B develop and use a formula to find the area of a rectangle.
e.g.,



What is the area of a playground with the following dimensions.

l = 100"
w = 60"
A = l x w
A = 100 x 60
A = 6,000 square inches

4.10.07

VOCABULARY

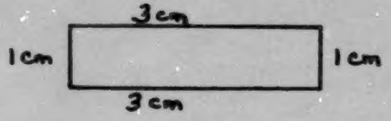
TERMS

area
square unit
region

GETTING STARTED

Prepare and distribute centimeter rulers. Ask the students to draw a rectangle. Say, "Pretend this rectangle is a garden. You want to put a fence around it. How much fencing must you buy? How can we solve this problem? (Find the perimeter.) Measure the sides of the rectangle. Add all of the sides and you will have the perimeter of the rectangle."

e.g.,



3 + 3 + 1 + 1 = 8 cm

Display a variety of items to the class, e.g., pencils, keys, rubber bands, paper clips, index cards, postage stamps... Say, "Which of these objects could easily be used to completely cover a sheet of paper leaving no gaps?" (postage stamps or index cards) Ask a student to demonstrate this. Show the difficulty of using some of the other objects. Discuss the reasons why some items are better than others to cover an area. (straight sides, square corners)

4.10.07

4.10.07.01 measure area using non-standard units

STRATEGY 1: Prepare shapes in various sizes, e.g., 2" square, 3x5 rectangle. Distribute shapes, paper and scissors.

Divide the class into groups. Say, "Completely cover the area of a desk using one shape. Trace the shape and cut out as many as you need to cover a desk." Draw the following chart on the chalkboard.

e.g.,

Group	Unit Used	Number of Units Needed

Ask a student from each group to come up and tape his/her shape on the table under Unit Used. Ask another student to fill in the number of units needed.

Say, "The units used were not the same size. That is why each group needed a different number of units to cover a desk."

STRATEGY 2: Prepare and distribute a supply of colored rods and squares cut from oak tag. Divide the class into groups. Ask each group to estimate the number of rods needed to fill each shape. Draw the following table on the chalkboard.

e.g.,

Figure	Estimate in Rods	Rods Used

Say, "Determine the actual area of each shape by counting the number of cubes needed to fill it." Ask each group to use a different color. Ask a student from each group to complete the chart. Compare estimates and findings.

4.10.07

4.10.07.02 **measure area using standard units**

STRATEGY 1: Prepare and distribute one inch graph paper. Ask the students to determine the area of their Math books by placing the book on top of the graph paper, tracing the outline and counting the number of squares inside the region. Say, "Area is expressed in terms of square units, in this case, inches. All of our answers are the same. This is the advantage of measuring area in standard units."

STRATEGY 2: Say, "Suppose that we want to put down a new tile floor in our classroom. How could we know how many tiles we would need to buy?" (We have to measure the area of the classroom.) Draw a one foot square on the chalkboard. Say, "This is the standard size of a floor tile. They are manufactured according to standard units, e.g., 1' x 1'. What would happen if we measured the area of the classroom floor with chalkboard erasers? (We would not know how many tiles to buy.) It is important to use standard units of measure." Ask the students to measure the area of the classroom by counting the floor tiles.

4.10.07.03 **develop and use a formula to find the area of a rectangle**

STRATEGY 1: Prepare and distribute $\frac{1}{2}$" graph paper. Say, "Draw rectangles with the following dimensions."
e.g.,

A) length of 5 units and a width of 3 units
B) length of 7 units and a width of 3 units
C) length of 6 units and a width of 2 units
D) length of 4 units and a width of 1 unit

STRATEGY 1: cont'd

Say, "Determine the area of each rectangle by counting the number of square units inside it." Draw a table on the chalkboard.

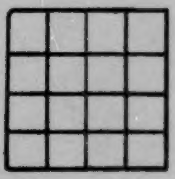
e.g.,

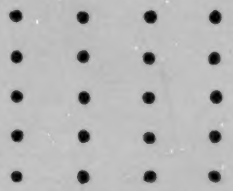
Length of rectangle	Width of rectangle	Area of rectangle
5 units	3 units	
7 units	3 units	
6 units	2 units	
4 units	1 unit	

Ask a student to come to the chalkboard and fill in the area of each rectangle. Say, "What is the relationship between the dimensions of a rectangle and its area?" (The area of a rectangle is equal to the product of its length and width.) Write the formula A = l x w on the chalkboard. Identify what each letter represents.

STRATEGY 2: Prepare and distribute unit pieces from a set of squared material, construction paper and scissors. Ask the students to cut out a rectangle. Say, "Determine the area of your rectangle by filling it with unit pieces. There is another way to determine the area of a rectangle. The rows and columns of square units in a rectangle are like an array.

e.g.,





We find the total number of objects in an array by multiplying the number in each row by the number in each column. The area of a rectangle can be determined by multiplying its length (rows) by its width (columns)."

Repeat this procedure using other rectangles.

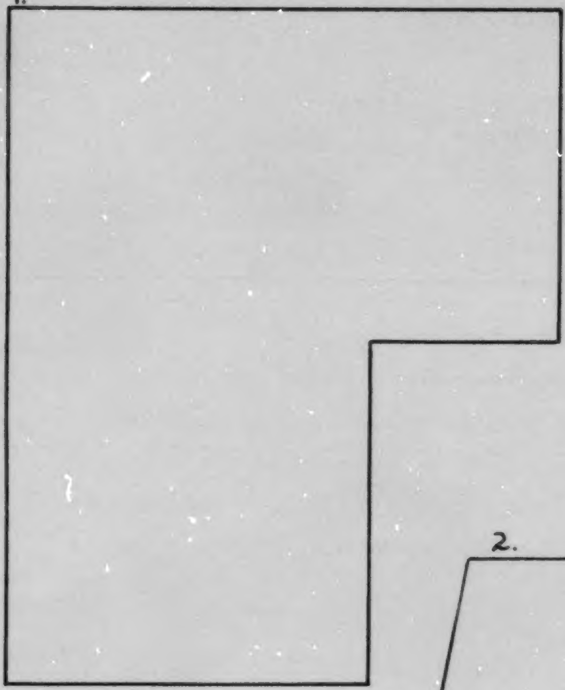
P.O. 4.10.07.01

NAME: ____________________ CLASS: __________ DATE: ________

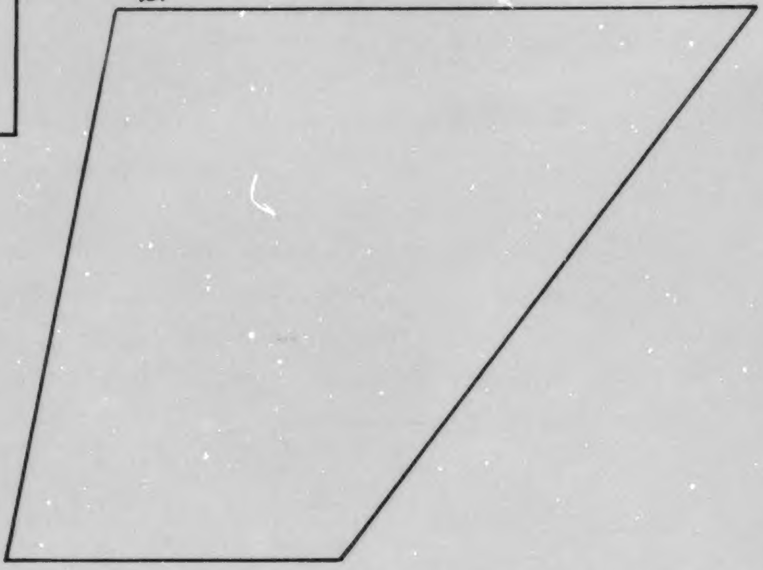
How many pencils cover each picture?
Check your answers with your neighbor and fill in the chart.

Picture	My Answer	My Neighbor's Answer
1		
2		
3		

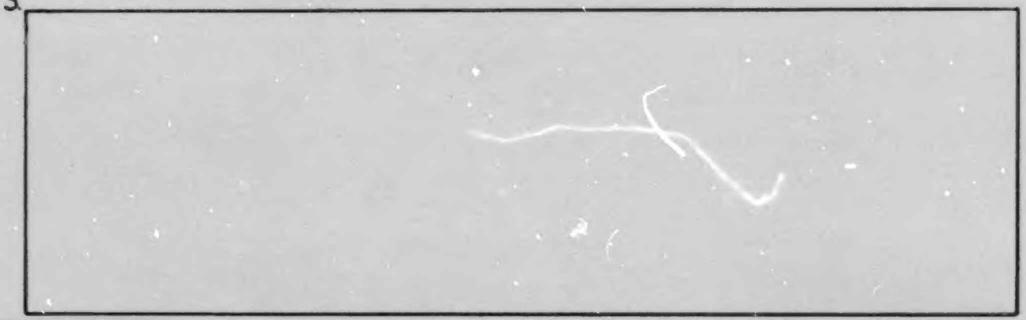
1.



2.



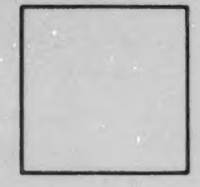
3.



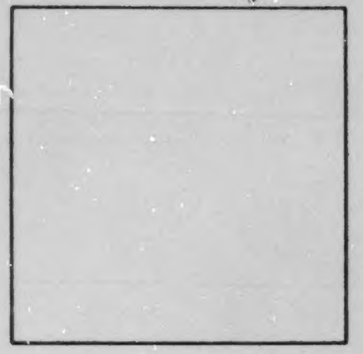
P.O. 4.10.07.02

NAME: ______________________ CLASS: __________ DATE: ________

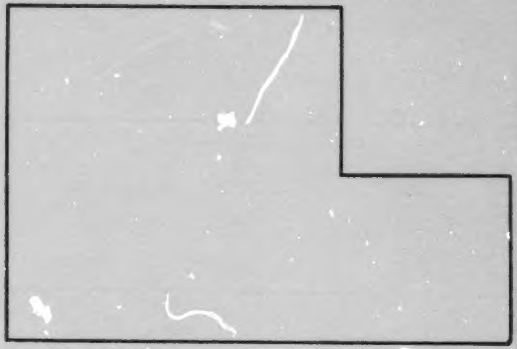
Use the square inch provided to measure the area of each figure.



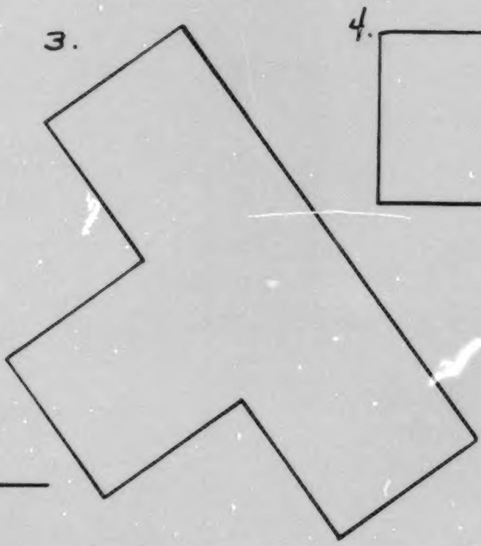
1. A = 4 sq. in.



2. A = ________

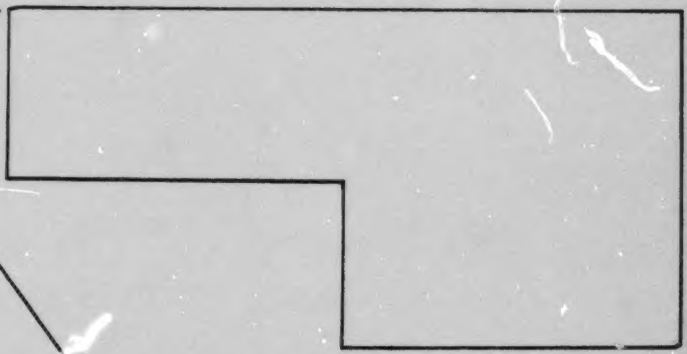


3.



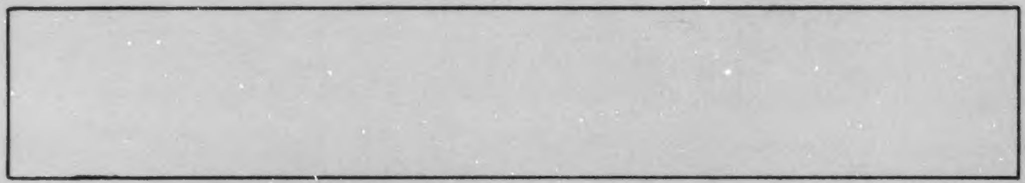
A = ________

4.



A = ________

5.

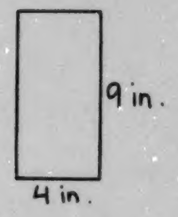


A = ________

NAME: ______________________ CLASS: ________ DATE: ________

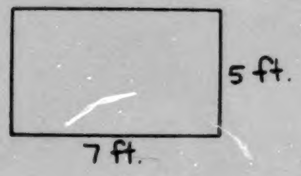
Find the area of each rectangle.
Complete the table for rectangles.

1.



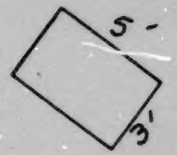
A = 36 sq in.

2.



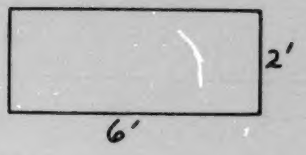
A = ________

3.



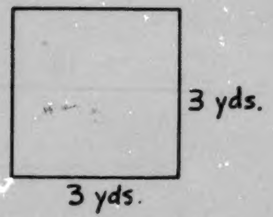
A = ________

4.



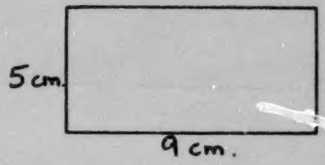
A = ________

5.



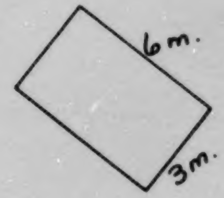
A = ________

6.



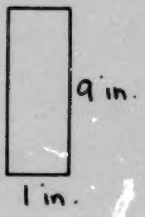
A = ________

7.



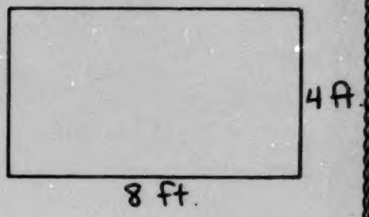
A = ________

8.



A = ________

9.



A = ________

Length	6 in.	2 ft.	9 cm.	8 yds.		7 in.
Width	9 in.	6 ft.	3 cm.		5 miles	
Area	54 sq in.			24 sq. yds	40 sq. miles	35 sq. in.

Unit 55

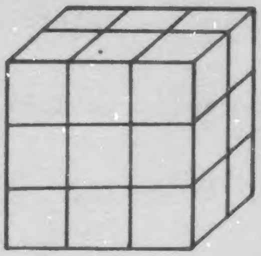
4.10.08 VOLUME

(1-2 lessons)

PERFORMANCE OBJECTIVES

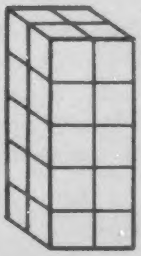
The student will be able to...

4.10.08.01B measure volume using non-standard units; e.g.,



How many cubes would it take to fill this?

4.10.08.02B measure volume using standard units. e.g.,



Volume = 20 cubic units

4.10.08

VOCABULARY

TERMS

volume
cubic centimeter
rectangular prism
solid
cube
face

GETTING STARTED

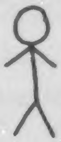
Ask the students to identify models such as rectangular prism, triangular prism, cylinder, sphere or cone.

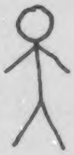
e.g.,

1) cereal box (rectangular prism)
2) tennis ball (sphere)
3) drinking straw (cylinder)
4) a party hat (cone)

Divide the class into two teams. Draw a stick figure on the chalkboard for each team.

e.g.,





Alternating teams and rotating players, ask the following types of questions.

e.g.,

"What type of solid geometric figure is a cereal box?"
"What unit of metric measure do you use when you are measuring your dish?"

For each incorrect answer erase a part of the stick figure. The team with the most complete stick figure wins.

4.10.08

4.10.08.01 measure volume using non-standard units

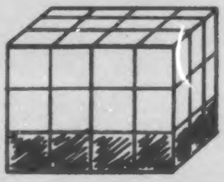
STRATEGY 1: Prepare and distribute rectangular prisms and blocks in various sizes to groups of students. Say, "Find the volume of each rectangular prism. Use different blocks to figure out the volume. Did you use the same number of blocks each time? A standard unit is needed to measure volume. Otherwise we do not know how much a container can hold."

STRATEGY 2: Prepare several rectangular prisms and the following: blocks, pencils, marbles. Ask the students to fill the rectangular prism. Say, "Did we use the same number of objects each time? (No) Do we know exactly how much each rectangular prism can hold? (No) Our measurement is not accurate because we did not use a standard measure."

4.10.08.02 measure volume using standard units

STRATEGY 1: Prepare and distribute rectangular prisms to groups of students. Ask the students to make layers using 1cm x 1cm blocks to fill the rectangular prisms. Say, "How many layers did you make? Count the blocks in the top layer. If there are 12 blocks in one layer and there are three layers, then the volume of the container is 36 cubic centimeters since 12 x 3 = 36. A cubic centimeter is one standard unit in the metric system of measuring volume."

e.g.,



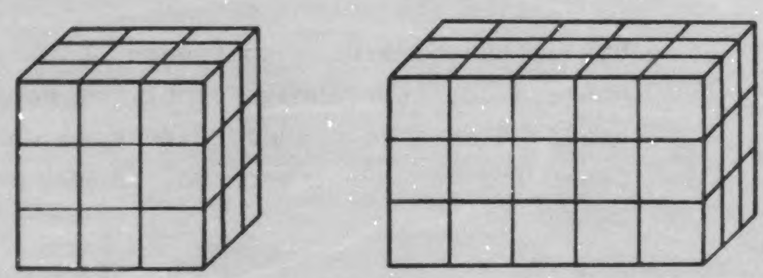
4.10.08

STRATEGY 1: cont'd

Repeat this procedure varying the dimensions of the rectangular prism.

STRATEGY 2:

Place the following diagrams on the chalkboard. e.g.,

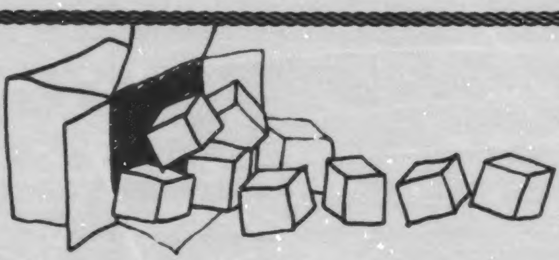


Ask the students to count the number of blocks that would fill each rectangular prism. Ask the students to find the volume for figure I. Say, "How many layers? (3) How many blocks in each layer? (3) What is the volume?" (9) Repeat for figure II.

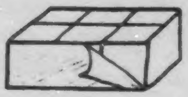
P.O. 4.10.08.01.-02

NAME: ______________________ CLASS: __________ DATE: ________

Give the volume of each rectangular prism filled with cubic centimeter blocks.

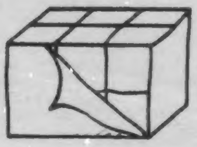


1.



____

2.



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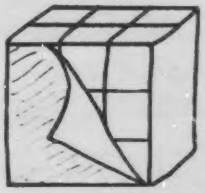
3.



____

4. 4 layers of blocks
2 blocks width
3 blocks length

____

5.
5 layers of blocks
3 blocks width
3 blocks length

____

6.
8 layers of blocks
2 blocks length
2 blocks width

____

4.07.03 ADDITION OF DECIMALS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.07.03.01A add decimals through hundredths;

e.g.,

$$\begin{array}{r} 5.07 \\ \underline{+4.12} \\ 9.19 \end{array} \qquad 0.4 + 0.37 + 0.19 + 0.02 = 0.98$$

4.07.03.02A solve word problems related to skills learned in this module.

e.g.,

Stanley had $50.00 in his savings account. He deposited $25.00. How much money does he now have in his savings account?

$$\begin{array}{r} \$50.00 \\ \underline{+25.00} \\ \$75.00 \end{array}$$

238

544

4.07.03

VOCABULARY

TERMS	SYMBOLS
decimal decimal point	

GETTING STARTED

Prepare squared material. Write 3, 3.0 and 3.00 on the chalkboard. Say, "Are these values equal?" Ask a student to use the material and show 3 wholes. (3 squares) Ask another student to show 3.0 and 3.00. Compare the material to show equal value.

Continue this procedure.

Prepare three sets of cards, one set with 1-digit numbers, one set with 2-digit numbers and one set with 3-digit numbers. Ask a student to select a card from each set. The student who can make the highest sum wins.

Repeat this procedure using other cards.

4.07.03

4.07.03.01 **add decimals through hundredths**

STRATEGY 1: Write the following on the chalkboard.

e.g.,

$$\begin{array}{r} 4.71 \\ \underline{+2.83} \end{array}$$

Ask a student to come to the chalkboard and find the sum. Say, "Adding decimals is the same as adding whole numbers. We must always remember to line up the numbers and place the decimal point in the correct place. First we add hundredths, then tenths, then whole numbers."

Write other examples on the chalkboard. Ask the students to line them up correctly and find the sum.

e.g.,

$$0.4 + 2.4 + 0.76 + 1.81 = \square \qquad \begin{array}{r} 0.4 \\ 2.4 \\ 0.76 \\ \underline{1.81} \\ 5.37 \end{array}$$

STRATEGY 2: Prepare and distribute play money to each student. Write a price list on the chalkboard.

e.g.,

Item	Cost
apple	$ .25
milk	$ .45
sandwich	$1.25
soda	$ .70
popcorn	$ .85

Say, "Choose any three items. Place the appropriate amount of money on your desk and find the sum."

Ask a student to write his/her example on the chalkboard. Say, "Start adding the pennies or hundredths of a dollar, next add the dimes or

STRATEGY 2: cont'd

tenths and finally add the dollars or wholes. Remember to put the decimal point in its proper position."

Repeat this procedure using other numbers.

4.07.03.02 **solve word problems related to skills learned in this module**

STRATEGY 1: Write the following problem on the chalkboard.

> A man spent $27.25 at the supermarket on Tuesday. On Saturday he spent $54.15. How much did he spend in all?

Say, "What are the key words? What operation will we use to find the answer? About how much money do you think the man spent?"

Ask the students to solve the problem. Continue this procedure using other problems.

STRATEGY 2: Write the following problem on the chalkboard.

> Sue ran 2.3 km on Monday, 1.3 km on Wednesday and 0.8 km on Friday. How many km did she run in all?

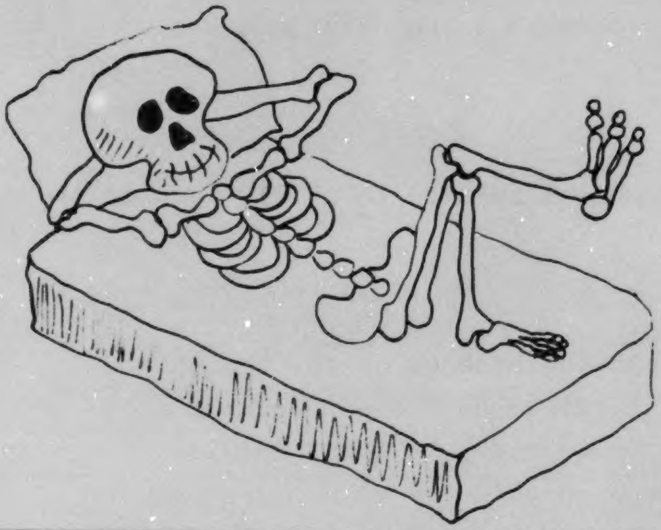
Say, "What are the steps needed to solve a word problem?" Elicit the steps, e.g., key words, correct operation, estimate, solve and label. Ask a student to solve the problem and label the answer.

Repeat this procedure using other word problems.

P.O. 4.07.03.01

NAME: ______________________ CLASS: __________ DATE: ________

Add. Use the key to solve the riddle.



What do you call a skeleton laying in bed?

5.07 + 4.12 9.19 L	0.4 0.37 0.19 + 0.02	0.03 + 2.15	7.63 + 8.49

0.6 0.12 0.28 + 1.30	0.16 + 0.2	1.06 1.10 3.22 + 4.35	0.5 + 1.5	3.6 4.16 1.01 + 2.24

Key

A	B	E	L	N	O	S	Y	Z
0.98	2.30	2	9.19	9.73	0.36	11.01	16.12	2.18

P.O. 4.07.03.02

NAME: ______________________ CLASS: ________ DATE: ________

Solve the problems.

Arthur bought 2.19 kg of swiss cheese and 1.08 kg of American cheese. How many kgs. did he buy in all?

Roz spent $1.76 for juice, $2.07 for chicken, $3.85 for meat and $.62 for milk. How much did she spend in all?

Orange Juice
Milk

Jose and his family drove 24.5 kilometers on Tues. and 75.12 kilometers on Wed. How many kilometers did they drive in all?

John bought a notebook for $1.29, a pencil for $.29 and a bookbag for $5.75. How much did he spend in all?

4.07.04 SUBTRACTION OF DECIMALS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.07.04.01A subtract decimals through hundredths and check;

e.g.,

$$\begin{array}{r} \\ 0.37 \\ \underline{-0.14} \\ 0.23 \end{array} \qquad \begin{array}{r} \underline{\text{check}} \\ 0.23 \\ \underline{+0.14} \\ 0.37 \end{array}$$

$$\begin{array}{r} \\ 5.86 \\ \underline{-3.59} \\ 2.27 \end{array} \qquad \begin{array}{r} \underline{\text{check}} \\ 3.59 \\ \underline{+2.27} \\ 5.86 \end{array}$$

4.07.04.02A solve word problems related to skills learned in this module.

e.g., Jenny had \$5.00 in her bank. She made a withdrawal of \$1.50 to buy a book. How much money was left in her bank?

$$\begin{array}{r} \$5.00 \\ \underline{-1.50} \end{array}$$

\$3.50 was left in Jenny's bank.

4.07.04

VOCABULARY

TERMS

regroup
difference
hundredth
tenth
decimal

GETTING STARTED

Prepare play money. Display two dollars, three dimes and four pennies. Draw a chart on the chalkboard. Ask the students to copy the chart in their notebooks and record the displayed amount.

e.g.,

Dollars	•	Dimes	Pennies
2	•	3	4

Say, "John needs one dollar, five dimes and four pennies. How much will I have left?" Ask the students to record this amount in their charts. Say, "Let's start subtracting with pennies. How many pennies are left? (0) Do I have enough dimes to give away 5? (No, we must exchange 1 dollar for 10 dimes.) Now we have 1 dollar and 13 dimes." Ask the students to record this in their charts. Say, "How many dimes are left? (8) How many dollars are left?" (0)

Prepare two sets of cards with the digits 0 through 9. Ask two students to choose four cards, make two 2-digit numbers and find the difference between the numbers. The player with the greatest difference wins.

e.g.,

$\boxed{4}$ $\boxed{6}$

$\boxed{3}$ $\boxed{0}$

$$\begin{array}{r} 64 \\ \underline{-30} \\ 34 \end{array}$$

4.07.04

4.07.04.01 **subtract decimals through hundredths and check**

STRATEGY 1: Write 62 - 38 = ☐ on the chalkboard. Say, "Are there enough ones to take away 8? (No) What can you do?" (Exchange 1 ten for 10 ones.) Ask a student to complete the subtraction. Write 0.62 - 0.38 = ☐ on the chalkboard. Repeat the above procedure. Say, "How does finding the difference with whole numbers help in finding differences with decimals?" (Decimals are subtracted in the same way as whole numbers.)

STRATEGY 2: Write the following on the chalkboard.
e.g.,

I had 64 soda cans. 0.64 gallons
I used -30 soda cans. -0.30 gallons
I had soda cans left.

Say, "How are these examples alike? How are they different? (One example uses whole numbers and the other uses decimals.) You find the difference in decimals by subtracting the columns in the same manner as with whole numbers. Start on the right with hundredths and move to the left (tenths)."

Write 0.6 -0.34 = ☐ on the chalkboard. Ask a student to align the decimal points and digits. Say, "Why must you place a zero in the hundredths column?" (to hold the place) Subtract the hundredths. Say, "Are there enough?" (No, regroup 1 tenth as 10 hundredths.) Subtract the hundredths; subtract the tenths. Ask a student to place the decimal point in the answer and read the answer.

e.g.,

$$\begin{array}{r} 0.\overset{5}{\cancel{6}}\,{}^{1}0 \\ \underline{-0.3\;4} \end{array}$$

4.07.04

4.07.04.02 **solve word problems related to skills learned in this module**

STRATEGY 1: Ask a student to read the following problem.

> Jenny had a box of beads. The cover said there were 100 beads in the box. Inside the box there were only 45 beads. Jenny used 21 of these for a necklace. How many beads were left in the box?

Say, "What part of the whole did Jenny start with?" (45 out of 100) Write a decimal for this. (0.45) Say, "What happened next?" (She used 21 out of 100.) Ask a student to write the decimal 0.21 on the chalkboard. Say, "What operation do I use to solve this problem?" (subtraction) Write the example on the chalkboard.

e.g.,

$$\begin{array}{r} 0.45 \\ \underline{-0.21} \end{array}$$

Ask a student to complete the subtraction and label the answer.

STRATEGY 2: Distribute supermarket ads to the students. Say, "I had $1.59. I purchased rice for $1.25. How much is left? What operation will I use to solve this problem?" (subtraction) Write the example on the chalkboard.

e.g.,

$$\begin{array}{r} \$1.59 \\ - \underline{1.25} \end{array}$$

Ask a student to complete the subtraction.

Repeat this procedure.

P.O. 4.07.04.01

NAME:__________ CLASS:________ DATE:________

A - Subtract
B - Complete the subtraction wheel by finding the difference between the center decimal and the decimal on the same spoke.

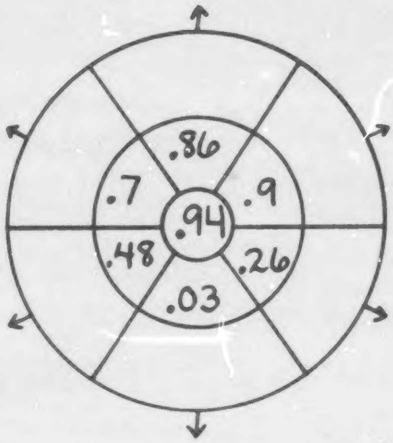
A.

$$\begin{array}{r} 36 \\ -\ 12 \\ \hline \end{array} \qquad \begin{array}{r} .36 \\ -\ .12 \\ \hline \end{array} \qquad \begin{array}{r} 72 \\ -\ 36 \\ \hline \end{array} \qquad \begin{array}{r} .72 \\ -\ .36 \\ \hline \end{array}$$

$$\begin{array}{r} 50 \\ -\ 24 \\ \hline \end{array} \qquad \begin{array}{r} .5 \\ -\ .24 \\ \hline \end{array} \qquad \begin{array}{r} 78 \\ -\ 50 \\ \hline \end{array} \qquad \begin{array}{r} .78 \\ -\ .5 \\ \hline \end{array}$$

B.

$$\begin{array}{r} .94 \\ -\ .86 \\ \hline \end{array}$$



P.O. 4.07.04.02

NAME: ______________________________ CLASS: ________ DATE: ________

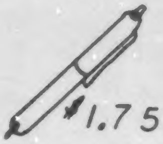
Solve.

1. Janice had .$89. She spent $.75 . Now she has ________.

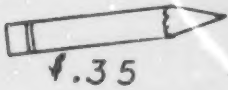
IN GOD WE TRUST

2. $.89 was in Joe's bank. He took out $.24
Now he has _________ .

3. Joel had $3.25. He purchased this pen. Now he has __________.



4. How much change will you get from a $5.00 bill?



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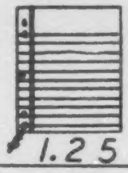

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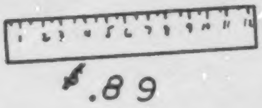


______

5. John had $.79. He purchased crayons for .31.
How much money is left?

6. Joan had $6.79. She bought a shirt for $2.25. How much money is left?

Unit 58

4.07.05 MULTIPLICATION OF DECIMALS TO TENTHS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.07.05.01A multiply decimals;

e.g.,

$$\begin{array}{r} 2.4 \\ \underline{\times 1.2} \\ 4\ 8 \\ \underline{24\ 0} \\ 2.88 \end{array}$$

4.07.05.02A solve word problems related to skills learned in this module.

e.g.,

Find the area of a rectangle
2.4m x 1.2m

$$\begin{array}{r} 2.4 \\ \underline{\times 1.2} \\ 4\ 8 \\ \underline{24\ 0} \\ 2.88 \text{ sq. m} \end{array}$$

4.07.05

VOCABULARY

TERMS

decimal
tenths
hundredths
product
factor
array

GETTING STARTED

Prepare and distribute squared material. Write $\begin{array}{r}46\\ \underline{\times\ 3}\end{array}$ on the chalkboard. Ask the students to display three sets of 4 tens and 6 ones. Say, "How many ones are there? (18) How can you regroup them? (1 ten and 8 ones) How many tens are there in all now? (13) How can you regroup them? (1 hundred and 3 tens) What is the answer?" (1 hundred, 3 tens and 8 ones) Write the answer under example on the chalkboard showing exchange.

e.g.,

$$\begin{array}{r}46\\ \underline{\times\ 3}\\ 138\end{array}$$

Repeat using other examples.

Prepare two sets of cards. One set with decimals expressed in tenths and one set with fractions expressed in tenths. Place the cards face down in two rows. Say, "We will play 'Concentration'. Choose one card from each row. If they match, you go again. If not, replace the cards and another student will have a turn."

Continue playing until all of the cards have been matched.

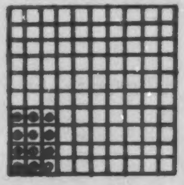
e.g.,

$\boxed{\frac{9}{10}}$ $\boxed{0.9}$

4.07.05

4.07.05.01 multiply decimals

STRATEGY 1: Prepare and distribute squared material to each student. Ask the students to place a hundreds card on their desks. Say, "What does the square represent? (1 whole) ...each column? (0.1) ...each little square? (0.01) Cover three squares in the first through fourth columns."
e.g.,



Ask a student to write a decimal to show the columns (0.4) and the rows (0.3). Say, "We can express this arrangement as a multiplication example." Write $\begin{array}{r} 0.4 \\ \underline{\mathrm{x}0.3} \end{array}$ on the chalkboard. Ask the students to count the covered squares (0.12). Write 0.12 under the example.

Say, "When multiplying decimals, you multiply the numbers. Then, count the digits to the right of the decimal point in each factor and count off the same number of places in the product." Repeat this procedure using other examples.

STRATEGY 2: Write $\begin{array}{r} 1.7 \\ \underline{\mathrm{x}1.2} \end{array}$ on the chalkboard. Ask a student to multiply the example ignoring the decimal points.
e.g.,

$$\begin{array}{r} 1.7 \\ \underline{\mathrm{x}1.2} \\ 3\ 4 \\ \underline{17} \\ 204 \end{array}$$

Say, "When multiplying decimals, we multiply as we always do. Then, we count the number of decimal places in each factor. How many in factor 1? (1) ...factor 2? (1) How many in all? (2) Finally, we count off the same number of places and place the

STRATEGY 2: cont'd

decimal point in the answer."

e.g.,

```
  1.7   1 digit
 x1.2   1 digit >2 digits
  3 4
 17 0
 2.04   2 digits
```

Repeat this procedure using other numbers.

4.07.05.02 **solve word problems related to skills learned in this module**

STRATEGY 1: Write the following problem on the chalkboard.

How much fabric is needed to cover a frame 5.3 inches long and 3.8 inches wide?

Ask the students to determine the correct operation needed to solve the problem. Say, "When multiplying numbers with decimals, proceed as usual, but you must remember to count the places before placing the decimal point in the answer." Ask the students to solve the problem using good problem solving techniques.

Repeat this procedure using other problems.

STRATEGY 2: Write the following problem on the chalkboard.

A book cost $2.35. What is the price of three books?

Say, "What kind of problem is this?" Ask a student to write the example on the chalkboard.

e.g.,

```
$2.35
  x 3
```

Say, "How many decimal places in this example? (2) Remember to count two places in your answer." Ask the students to solve the problem.

Repeat this procedure using other examples.

P.O. 4.07.05.01

NAME: ______________________ CLASS: ________ DATE: ________

Multiply. Use the key to solve the riddle.

What is another name for a parrot?

A W ___ ___ ___ ___
1 2 3 4 5

___ ___ ___ ___ ___
6 7 8 9 10

① .6 X .4 .24 W	② 1.7 X .6	③ 1.6 X .7	④ .9 X .3	⑤ 7.4 X .2
⑥ 7.1 X .8	⑦ 1.2 X .8	⑧ 5.6 X .2	⑨ .3 X .9	⑩ 3.7 X .4

Key

B	D	I	O	R	W	Y
5.68	.27	.96	1.02	1.12	.24	1.48

560

P.O. 4.07.05.02

NAME:______________________________ CLASS:________ DATE:_______

Tell the operation needed to solve each problem. ⊕ ⊖ ⊗
Circle the correct answer.

Plant was 9.7 inches tall. Now it is 10.3 inches tall. How much has it grown?
6.inch .6 inch 20.0 inch

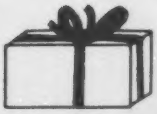
Jim swims a mile in 15.2 min. Mary swims a mile in 18.42 min. Jim is how much faster than Mary?
3.22 min 32.2 min 33.62 min

Mary ate 2.1 pints of ice cream. Sally ate .09 pints and Carol ate 3.4 pints. How much ice cream did they eat together?
6.4 pints 5.5 pints 5.9 pints

Each bow uses 1.12 ft. of ribbon. How much ribbon do I need to make 7 bows?
8.12 ft 5.28 ft. 7.84 ft.

How many yard squares of carpet are needed to cover a floor. 3.3 yards wide and 4.25 yards long?
14.025 yd 12.752 yd. 7.55 yd.

I bought a gift for $10.38 and food for $205.69. How much did I spend?
$195.31 $500. $216.07



4.01.06 PATTERNS IN NUMERATION

(2-3 lessons)

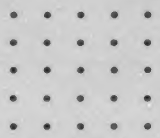
PERFORMANCE OBJECTIVES

The student will be able to...

4.01.06.01A find patterns in the sequence of numbers; e.g.,

3,7,11,__,__,__,27

4.01.06.02B find patterns for square numbers;



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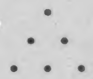
Square Numbers

4.01.06.03B find patterns for triangular numbers. e.g.,



6

Triangular Number

4.01.06

VOCABULARY

TERMS

series
sequence
patterns
attributes

GETTING STARTED

Prepare and distribute chips in different colors. Ask the students to work with the chips to complete a pattern.
e.g.,

1) Red Blue Green Red ___
2) Blue Blue Yellow Blue ___
3) Red Blue Green Green Red ___
4) Red Blue Blue Blue Red ___

Play "Guess My Rule." Write numbers on the chalkboard.
e.g.,

First Number	Second Number
2	4
8	16
3	6
5	?
7	?

Ask the students to think of what they could do to 2 to get 4. (Add 2.) Say, "Test this on the second pair of numbers, 8 and 16. (It does not work.) Go back to 2 and 4 and think of something else to do to 2 to get 4. (multiply by 2) Test this on 8 and 16. Try it on the third set numbers, 3 and 6. Now you have the rule."

Repeat this procedure.

4.01.06

4.01.06.01 **find patterns in the sequence of numbers**

STRATEGY 1: Write this chart on the chalkboard.

e.g.,

Starting Number	Rule 1 x 3	Rule 2 - 1	Rule 3 x 2
3	9	8	16
4	12	11	22

Complete this series with the students. Start a new series. Put circles around the numbers and underline the operation used to obtain the next number in the series.

e.g.,

② $\underline{x2}$ ④ $\underline{+3}$ ⑦ $\underline{-1}$ ⑥ $\underline{x2}$ ⑫ $\underline{+3}$ ⑮ __

Say, "What do you notice is happening in the sequence? (The operations used are repetitive.) What must be done to the 15 to complete the series?" (-1)

Repeat this procedure with other sequences.

STRATEGY 2: Prepare a spinner divided into ten equal parts labeled with the digits 0 through 9. Draw this chart on the chalkboard.

e.g.,

Starting Number	Rule 1	Rule 2	Rule 3
☐	x☐	−☐	+☐

Use the spinner to fill in the blank boxes on the chart. Perform the rules on the starting number.

e.g.,

Starting Number	Rule 1	Rule 2	Rule 3
	$x\boxed{2}$	$-\boxed{3}$	$+\boxed{4}$
6	6x2 = 12	12-3 = 9	9+4 = 13

Sequence: 12, 9, 13, __, __, __

Say, "We can complete the sequence by going back to rule 1. (13x2 = 26) What must we do to 26?" (-3)

Repeat this procedure. The operations can be changed each time.

4.01.06

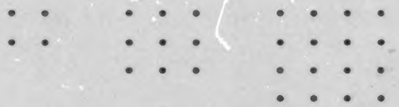
4.01.06.02 **find patterns for square numbers**

STRATEGY 1: Prepare and distribute unit pieces. Say, "Use your unit pieces to make a square. What do you notice about the squares? (same number of rows as columns) When the same two factors are multiplied, the product can be shown as a square."

Repeat this procedure.

STRATEGY 2: Write the following examples on the chalkboard.
e.g., 2 x 2   3 x 3   4 x 4   5 x 5

Ask the students to find the products. Say, "I can draw pictures to represent the products." Draw the following pictures on the chalkboard.
e.g.,

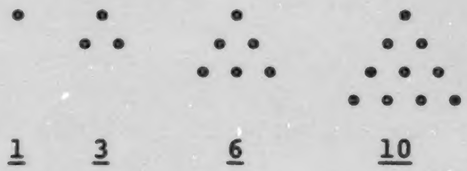


Say, "What shapes did I draw? (squares) What were the factors in all of the examples we used? (The two factors were the same.) When we multiply like factors, the product can be represented as a square."

Repeat this procedure using other numbers.

4.01.06.03 **find patterns for triangular numbers**

STRATEGY 1: Draw the following chart on the chalkboard.
e.g.,

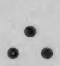
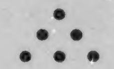
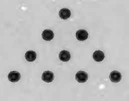


Say, "What is the shape of each set of circles? (triangle) How did I know how many to put in the

STRATEGY 1: cont'd

last row of each set?" (One more than the preceding row.) Write the totals in the blanks on the chalkboard. Ask a student to draw the next triangle to complete the sequence. Continue until there are ten numbers in the sequence. Complete the following chart.

e.g.,

Circles	Total	Number of Circles in the last row
	1	1
	3	2
	6	3
	10	4

Say, "What do you notice about the numbers in the last column?" (The numbers are in counting order.)

Repeat this procedure using other series.

STRATEGY 2: Write the following examples on the chalkboard.

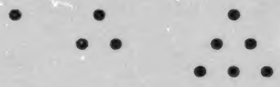
e.g.,

1) $0 + 1 = \square$ 3) $1 + 2 + 3 = \square$

2) $1 + 2 = \square$ 4) $1 + 2 + 3 + 4 = \square$

Ask the students to find the sums. Say, "Form a sequence using the sums." e.g., 1, 3, 6, __. Say, "We can draw dot pictures in the shape of triangles to illustrate the addends and sums in this sequence."

e.g.,



1 3 6

Ask the students to continue the sequence in three steps.

a) Write the addends;
b) Find the sum;
c) Draw the picture.

P.O. 4.01.06.01

NAME: ____________________ CLASS: ________ DATE: ________

Complete the sequences.

1 4 +

Help Mr. Math find the right number.

/ 3 × 7

2, 4, 3, 6, 5, ___, ___

×2 −1 ×2 −1 ×2 −1

3, 2, 5, 4, 7, ___, ___

1, 3, 6, 5, 7, 10, 9, ___, ___, ___, ___

Teaser:

2, 4, 7, 6, 12, 15 ___, ___, ___, ___, ___, ___

Make up your own sequence.

P.O. 4.01.06.02

NAME: ______________________ CLASS: ________ DATE: ________

Fill in the columns.

Triangular Numbers	Dot Shapes	Addends
① 1	●	1
② 3	∴	1+2
③ 6		
④ 10		
⑤ 15		
⑥ 21		
⑦ 28		
⑧ 36		
⑨ 45		

P.O. 4.01.06.03

NAME: ____ CLASS: __________ DATE: ________

Draw an array that forms a square.
Find the factors.

9 ● ● ● ● ● ● ● ● ● 3 x 3	25
4	36
49	16
64	81

Unit 60

4.01.07 PLACE VALUE THROUGH HUNDRED MILLIONS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.01.07.01A identify place value to hundred millions; e.g.,

HUNDRED MILLION	TEN MILLION	MILLION	HUNDRED THOUSAND	TEN THOUSAND	THOUSAND	HUNDRED	TEN	ONE
9	8	7	6	3	1	0	2	4

4.01.07.02B identify and write 7-, 8- and 9-digit numbers in standard and expanded forms; e.g.,

7,532,468 = 7,000,000 + 500,000 + 30,000
+ 2,000 + 400 + 60 + 8

4.01.07.03A translate a verbal phrase into a number and a number into a verbal phrase. e.g.,

six million three hundred forty two
= 6,000,342

4.01.07

VOCABULARY

TERMS

verbal phrase
hundred million

GETTING STARTED

On the chalkboard, write math riddles.

1) The largest 6-digit number using six different digits whose sum is 21. (e.g., 6,5,4,3,2,1)
2) The largest 6-digit number you can write using even numbers. (888,888)
3) The smallest 6-digit number you can write using odd numbers (111,111)
4) The smallest 6-digit number you can write with a seven in the hundred thousands column. (700,000)
5) The largest 6-digit number you can write with a zero in the ten thousands column and a one in the hundred thousands column. (109,999)

Prepare a set of cards numbered from 0 through 9. Ask the students to set up a paper with six empty boxes.

e.g., ☐ ☐ ☐
☐ ☐ ☐

Show a digit card and ask the students to write the number in one of the boxes on his/her paper. After the sixth digit card has been shown, the student with the highest number wins. Variation: play for the lowest 6-digit number.

4.01.07

4.01.07.01 **identify place value to hundred millions**

STRATEGY 1: Draw a place value chart on the chalkboard.
e.g.,

MILLIONS			THOUSANDS			ONES		
H	T	O	H	T	O	H	T	O

Say, "The name of the heading is said every three digits, as shown by the commas, when you write a number." Write a 7-digit number on the chalkboard. e.g., 4326781. Say, "We start at the right and use commas to set off groups of three numbers. The commas separate the groups." Ask one student to write the number in the place value chart and another student to insert the commas in the proper place.

STRATEGY 2: Draw a place value chart on the chalkboard through millions. Prepare digit cards numbered 0 through 9. Ask a student to select 7, 8 or 9 cards and tape them randomly in the place value chart.
e.g.,

MILLIONS			THOUSANDS			ONES		
H	T	O	H	T	O	H	T	O
	6	0	8	4	3	1	2	9

Ask a student to read the number. Ask students to identify the place value of individual digits. e.g., 6 = 6 ten millions or 60 million.

4.01.07.02 **identify and write 7-, 8- and 9-digit numbers in standard and expanded forms**

STRATEGY 1: Write the number 7,532,468 on the chalkboard. Ask

STRATEGY 1: cont'd

a student to read the number. Say, "What is the value of the 7?" Write 7,000,000 on the chalkboard. Say, "What is the value of the 5?" Write + 500,000 next to the 7,000,000. Continue this procedure for the remaining digits. The final number should read as follows.

e.g.,

7,000,000 + 500,000 + 30,000 + 2,000 + 400 + 60 + 8

Say, "We expressed the standard number in expanded form."

Repeat this procedure, varying it by presenting the expanded number and asking students to state the standard number.

STRATEGY 2: Prepare and distribute an 8 x 8 grid, scissors and paste. Ask the students to fill in the grid as follows.

e.g.,

8	0	0	0	0	0	0	0
	7	0	0	0	0	0	0
		6	0	0	0	0	0
			5	0	0	0	0
				4	0	0	0
					3	0	0
						2	0
							1

Ask the students to cut the grid into eight strips. Say, "Which strip represents the largest number? (80,000,000) Lay that strip on your desk. Find the 7,000,000 strip. Cut off the blank square. Paste the 7,000,000 on top of the first strip so that the two ends on the right line up."

e.g.,

8	7	0	0	0	0	0	0

Ask a student to read the number. Continue this procedure, pasting one number upon the next, until 87,654,321 has been reached. Say, "We changed a number from its expanded form to its standard form."

4.01.07

4.01.07.03 **translate a verbal phrase into a number and a number into a verbal phrase**

STRATEGY 1: Write on the chalkboard one million two hundred forty-two thousand three hundred sixteen. Ask a student to indicate the number of places in this number by writing blanks on the chalkboard.

e.g.,

___, ___ ___ ___, ___ ___ ___

Ask another student to put the commas where they belong. Ask a third student to fill in the blanks with the proper digits.

e.g.,

1,242,316

Repeat this procedure. Vary by presenting the number first.

STRATEGY 2: Prepare a set of cards with one of the following written on each card: million, hundred thousand, ten thousand, thousand, hundred, ten and one. Prepare a set of cards numbered 0 through 9 in word form. Draw the following on the chalkboard.

e.g.,

___, ___ ___ ___, ___ ___ ___

Ask a student to choose two cards, one from each pile, e.g., four thousand. Say, "What number does this represent? (4000) Where would you write it on the chart on the chalkboard?"

e.g.,

___, ___ ___ _4_, ___ ___ ___

Repeat this procedure. Vary the procedure by writing a number on the chalkboard and asking the students to find the matching words.

P.O. 4.01.07.01

NAME:________________________ CLASS:________ DATE:_______

I. Write the place value of the underlined digit.
II. Build the number.
III. Write your own number.

I Write the place value of the underlined digit.

1) 7,652,321 ________________

2) 3,586,423 ________________

3) 6,954,827 ________________

4) 8,623,171 ________________

5) 1,465,870 ________________

II Build the number.

Millions			Thousands			Ones		
H	T	O	H	T	O	H	T	O

____

Write the number here.

7 in the ones' place
4 in the ten thousands' place
8 in the one thousands' place
6 in the hundred thousands' place
5 in the hundreds' place
2 in the tens' place
9 in the millions' place

III Write your own number.

Millions			Thousands			Ones		
H	T	O	H	T	O	H	T	O

____

Write the number here.

_ in the hundreds' place
_ in the tens' place
_ in the millions' place
_ in the thousands' place
_ in the hundred thousands' place
_ in the ten thousands' place
_ in the ones' place

P.O. 4.01.07.02

NAME: ____________________ CLASS: __________ DATE: ________

I. Write the value of each digit in the value chart.
II. Write each standard number as an expanded number
III. Match the numbers to the words.

I

MILLIONS			THOUSANDS			ONES		
H	T	O	H	T	O	H	T	O
		3	2	7	4	4	3	1

The digit 3 is in the million's place. It's value is 3,000,000.

____

____

____

____

____

____

II

1. 4,000,000 ______________________________
2. 4,531,000 ______________________________
3. 4,000,235 ______________________________
4. 5,694,210 ______________________________
5. 2,812,024 ______________________________

III

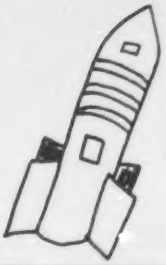
1. 8,080,080	a) eight million, eight
2. 8,888,000	b) eight million, eight hundred thousand, eight hundred
3 8,000,008	c) eight million, eighty thousand, eighty
4. 8,800,800	d) eight million, eight hundred eighty eight thousand

576

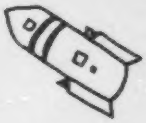
P.O. 4.01.07.03

NAME: ______________________ CLASS: ________ DATE: ________

Match.
Write the letter that goes with the number in the riddle box.



What is an astronaut's favorite time of day?



① 100,987,654	A FOUR HUNDRED SIXTY THREE MILLION, FIVE HUNDRED SEVENTY TWO THOUSAND, ONE HUNDRED
② 463,572,100	C FIFTY TWO MILLION, THREE HUNDRED TWENTY THOUSAND, SIX HUNDRED
③ 88,888,888	E ONE MILLION ONE THOUSAND ONE
④ 4,003,020	H SIX MILLION SEVEN HUNDRED SEVENTY SEVEN THOUSAND FIVE HUNDRED FIFTY FIVE
⑤ 52,320,600	I FORTY THREE MILLION, FIVE HUNDRED SIXTY SEVEN THOUSAND, EIGHT HUNDRED NINETY
⑥ 6,777,555	L ONE HUNDRED MILLION, NINE HUNDRED EIGHTY SEVEN THOUSAND, SIX HUNDRED FIFTY FOUR
⑦ 1,900,009	M THIRTY TWO MILLION, ONE HUNDRED NINETY EIGHT THOUSAND SEVEN HUNDRED SIXTY FIVE
⑧ 43,567,890	N FOUR MILLION THREE THOUSAND TWENTY
⑨ 32,198,765	T ONE MILLION NINE HUNDRED THOUSAND NINE
⑩ 1,001,001	U EIGHTY EIGHT MILLION EIGHT HUNDRED EIGHTY EIGHT THOUSAND EIGHT HUNDRED EIGHTY EIGHT

1	2	3	4	5	6	7	8	9	10
L									

4.06.07 ADDITION OF FRACTIONS WITH UNLIKE DENOMINATORS

(1-2 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

4.06.07.01B find common denominators;

e.g., $\frac{1}{8} + \frac{1}{4}$

$\frac{1}{4} \times \frac{2}{2} = \frac{2}{8}$

4.06.07.02A add fractions having unlike denominators;

e.g., $\frac{1}{2} + \frac{3}{8} = \square$

$\frac{4}{8} + \frac{3}{8} = \frac{7}{8}$

4.06.07.03A solve word problems related to skills learned in this module.

e.g.,

Michael helped his father do some repair work. He worked $\frac{1}{5}$ hour on Monday, $\frac{2}{10}$ hour on Tuesday, and $\frac{2}{5}$ hour on Thursday. How long did he work with his father in all?

$\frac{1}{5} + \frac{2}{10} + \frac{2}{5} = \square$

$\frac{2}{10} + \frac{2}{10} + \frac{4}{10} = \frac{8}{10}$

4.06.07

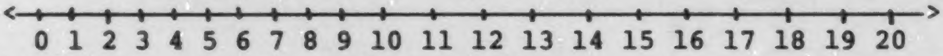
VOCABULARY

TERMS

equivalent
common denominator

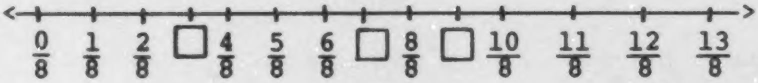
GETTING STARTED

Draw a number line on the chalkboard numbered from 0 through 20. e.g.,


0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Say, "How can you add 3 + 4 using the number line? (Begin at 0 and move three spaces and then another four spaces.) What is the sum of 3 + 4?" (7) Write 3 + 4 = 7 on the chalkboard. Repeat this procedure with other examples.

Draw a number line with some unlabeled points on the chalkboard. e.g.,


$\frac{0}{8}$ $\frac{1}{8}$ $\frac{2}{8}$ ☐ $\frac{4}{8}$ $\frac{5}{8}$ $\frac{6}{8}$ ☐ $\frac{8}{8}$ ☐ $\frac{10}{8}$ $\frac{11}{8}$ $\frac{12}{8}$ $\frac{13}{8}$

Say, "Which point shows $\frac{3}{8}$? How do you know that that point is $\frac{3}{8}$?" (If you are counting by eighths, the first box is three eighths.) Repeat this procedure until all the points on the number line have been labeled.

Repeat this procedure using other number lines.

4.06.07

4.06.07.01 find common denominators

STRATEGY 1: Prepare and distribute fractional parts (fourths and eighths). Say, "Place $\frac{1}{4}$ and $\frac{1}{8}$ on your desk. Can we add them? (no) Why? (The denominators are different.) How many fourths equal one eighth? Use your material to find the answer." Write the following on the chalkboard.

e.g.,

$$\begin{array}{rcl} \frac{1}{4} & = & \frac{2}{8} \\ \underline{+\frac{1}{8}} & = & \underline{\frac{1}{8}} \end{array}$$

Ask a student to complete the addition.

Say, "We can find common denominators without material. What number times 4 equals 8? (2) We multiply the numerator and denominator by 2." Write the following on the chalkboard.

e.g., $\frac{1}{4} \times \frac{2}{2} = \frac{2}{8}$

STRATEGY 2: Prepare and display a flannel board, fractional pieces (half, fourths) and one whole. Say, "This circle represents a whole. How can we use circular sections to add $\frac{1}{2} + \frac{1}{4}$? (First, we need to find how many $\frac{1}{4}$'s equal $\frac{1}{2}$.) How many $\frac{1}{4}$ pieces equal a $\frac{1}{2}$ piece? (two) Four is the common denominator."

4.06.07.02 add fractions having unlike denominators

STRATEGY 1: Prepare and distribute the fractional parts. (halves, fourths, eighths) Write $\frac{1}{2} + \frac{1}{8}$ on the chalkboard. Say, "How can we use the fractional pieces to find a common denominator for the two

STRATEGY 1: cont'd fractions? (Match $\frac{1}{2}$ to its equivalent fraction in eighths, $\frac{4}{8}$.) Place the $\frac{1}{8}$ and $\frac{4}{8}$ pieces next to each other. How many eighths do you have?" ($\frac{5}{8}$) Write the number sentence $\frac{4}{8} + \frac{1}{8} = \frac{5}{8}$ on the chalkboard. Repeat this procedure.

STRATEGY 2: Write the following on the chalkboard.

e.g.,

$$\begin{array}{r} \frac{1}{2} \\ + \frac{1}{8} \\ \hline \end{array}$$

Say, "What must we do to the denominators so that we can add? (Change them to like denominators.) What number times 2 equals 8?" (4) Write $\frac{1}{2} \times \frac{4}{4} = \frac{4}{8}$ on the chalkboard. Rewrite the example and ask a student to add.

e.g.,

$$\begin{array}{rcr} \frac{1}{2} & = & \frac{4}{8} \\ + \frac{1}{8} & & + \frac{1}{8} \\ \hline \end{array}$$

4.06.07.03 **solve word problems relating to skills learned in this module**

STRATEGY 1: Write this problem on the chalkboard.

> Joyce had $\frac{1}{2}$ carton of eggs. Linda had a $\frac{1}{4}$ of a carton of eggs. How much did they have in all?

Ask the pupils to read the problem. Say, "What information are you given? (One carton of eggs has $\frac{1}{2}$ the eggs; the other has $\frac{1}{4}$ of the eggs.) What information are you supposed to find? (total) How can we find the total?" (add) Write $\frac{1}{2} + \frac{1}{4}$ on the chalkboard. Say, "How can you add $\frac{1}{2} + \frac{1}{4}$?" (Find the common denominator.) Ask a student to rewrite the example with the common denominator.

STRATEGY 1: cont'd

e.g.,

$$\frac{2}{4} + \frac{1}{4} = \square$$

Ask another student to add and label the answer.

Repeat this procedure using other problems.

STRATEGY 2: Write this problem on the chalkboard.

> Michael and Loretta sanded $\frac{1}{4}$ foot of wood on Monday and $\frac{1}{8}$ of wood on Tuesday. How much wood did they sand in the two days?

Say, "What information are you to find? (the total amount of wood sanded) What procedure can we use? (add) How can the two fractions be added? (the common denominator for $\frac{1}{4}$ and $\frac{1}{8}$ must be found) What is the common denominator?" (8) Write $\frac{2}{8} + \frac{1}{8} = \square$ on the chalkboard. Say, "What is the sum of $\frac{2}{8} + \frac{1}{8}$?" ($\frac{3}{8}$) Write and solve the example on the chalkboard.

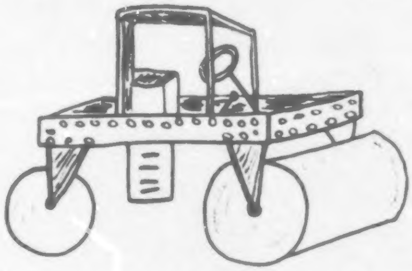
e.g.,

$$\frac{2}{8} + \frac{1}{8} = \frac{3}{8}.$$

P.O. 4.06.07.01

NAME:______________________ CLASS:________ DATE:________

Match the common denominator. Write the letter that matches the question in the secret answer box to find the answer to the riddle.



Why did the farmer run a steamroller across the field?

Because he wanted to raise.....

1) $\frac{1}{2}$ $\frac{1}{4}$

2) $\frac{3}{8}$ $\frac{1}{4}$

3) $\frac{5}{9}$ $\frac{1}{3}$

4) $\frac{1}{6}$ $\frac{1}{3}$

5) $\frac{1}{12}$ $\frac{1}{6}$

6) $\frac{1}{5}$ $\frac{1}{10}$

7) $\frac{1}{7}$ $\frac{2}{14}$

8) $\frac{1}{3}$ $\frac{1}{18}$

9) $\frac{1}{15}$ $\frac{2}{15}$

10) $\frac{1}{2}$ $\frac{1}{8}$

11) $\frac{2}{3}$ $\frac{3}{15}$

12) $\frac{1}{6}$ $\frac{1}{18}$

13) $\frac{1}{4}$ $\frac{1}{3}$

14) $\frac{1}{3}$ $\frac{1}{9}$

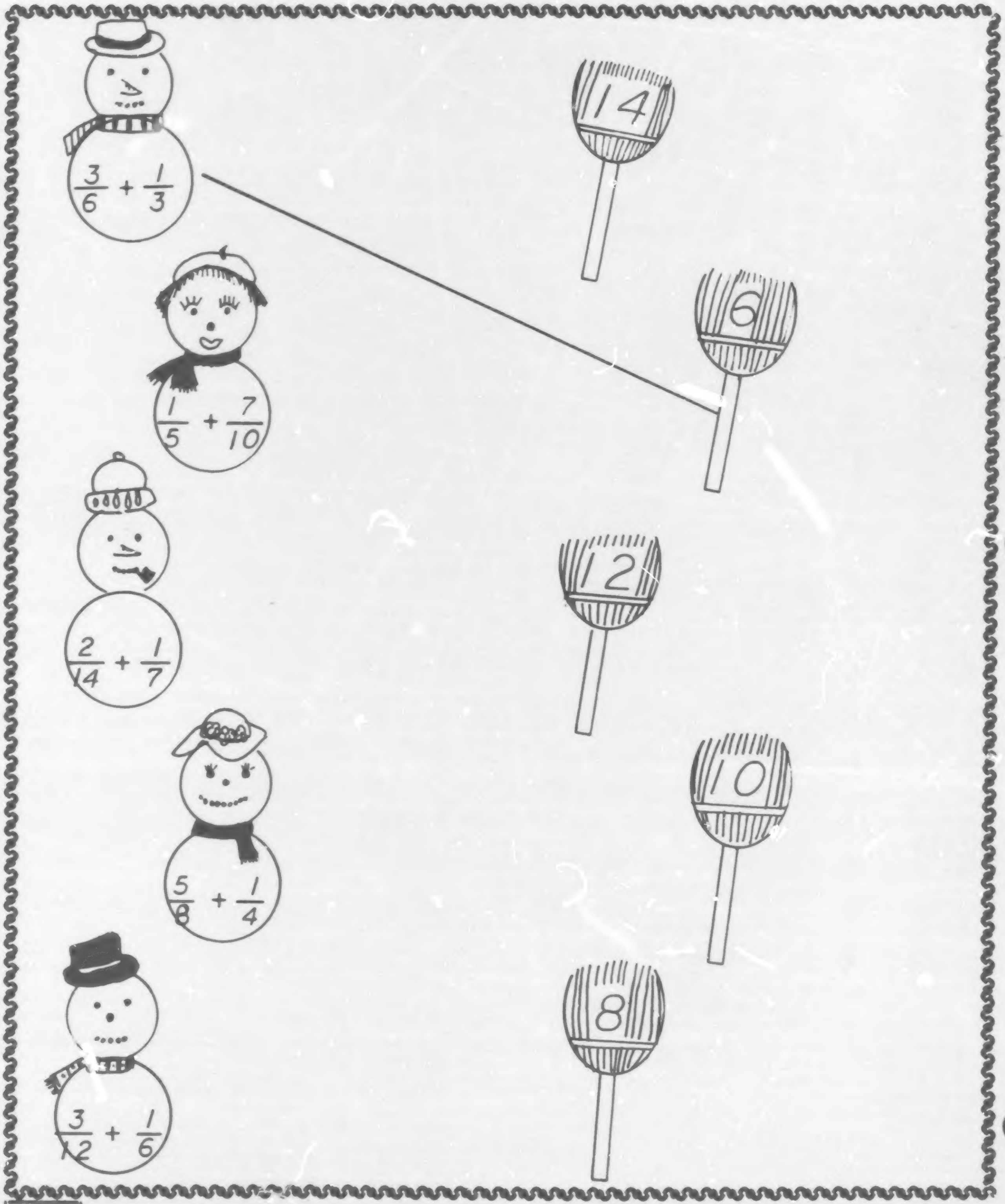
A. 8
E 12
D. 10
H. 6
M. 4
O. 18
P. 14
S. 9
T. 15

1	2	3	4	5	6	7	8	9	10	11	12	13	14
M													

P.O. 04.06.07.02

NAME:______________________________ CLASS:_________ DATE:_______

Match the snoman to his common denominator and add.


3/6 + 1/3
1/5 + 7/10
2/14 + 1/7
5/8 + 1/4
3/12 + 1/6
14
6
12
10
8

P.O. 04.06.07.03

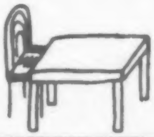
NAME:__________________________________CLASS:________DATE:_______

Find the common dominator to help you solve the problems.

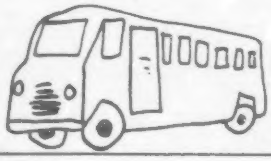
1. Michael helped his father do some repair work. He worked $\frac{1}{5}$ hour on Monday, and $\frac{2}{10}$ hour on Tuesday. How long did he work with his father altogether?

2. A pitcher had $\frac{1}{4}$ cup of water. Lynette added $\frac{1}{2}$ cup of water. How much water was in the pitcher?

3. At 5:00 $\frac{3}{5}$ of the seats were filled in a restauraunt. At 6:00 $\frac{1}{10}$ more of the restaurant was filled. What part of the resturaunt was filled at 6:00?



4. After the first stop $\frac{5}{8}$ of the children were on the bus. At the second stop another $\frac{1}{4}$ boarded the bus. What part of the bus was filled at 6:00



5. Camille ran $\frac{5}{8}$ of a mile. She stopped for a drink and ran another $\frac{1}{4}$ mile. How far did she run altogether?

4.06.08 SUBTRACTION OF FRACTIONS WITH UNLIKE DENOMINATORS

(1 lesson)

PERFORMANCE OBEJCTIVES

The student will be able to...

4.06.08.01A find equivalent fractions;

e.g.,

$$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8}$$

4.06.08.02A subtract fractions having unlike denominators;

e.g.,

$$\begin{array}{rcr} \frac{1}{2} & = & \frac{2}{4} \\ -\frac{1}{4} & & -\frac{1}{4} \\ \hline & & \frac{1}{4} \end{array}$$

4.06.08.03A solve word problems related to skills learned in this module.

e.g.,

Melissa walked $\frac{1}{2}$ mile to the dress store and $\frac{7}{8}$ mile to the grocery store. How much further away was the grocery store from the dress store?

$\frac{7}{8} - \frac{1}{2} =$ $\frac{1}{2} \times \frac{4}{4} = \frac{4}{8}$ P

$\genfrac{}{}{0pt}{}{8}{9} - \frac{4}{8} = \frac{3}{8}$

4.06.08

VOCABULARY

TERMS

equivalent
numerator
denominator
renaming
factor

GETTING STARTED

Write the following on the chalkboard.

Number of weeks

Number of days

Say, "If you know the number of weeks, how do you find the number of days?" (Multiply by 7.)

Repeat the procedure for other relations, e.g., cars and wheels, tripods and legs.

Prepare and display ten colored squares of construction paper on the chalkboard, e.g., four red, three blue, two green and one yellow. Say, "How many squares are there? (10) What part of the set of squares is red?" ($\frac{4}{10}$)

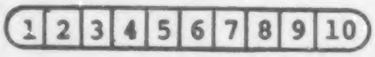
Repeat this procedure.

4.06.08

4.06.08.01 **find equivalent fractions**

STRATEGY 1: Prepare and distribute ten popsicle sticks to each student. Demonstrate how to rule the sticks into ten sections.

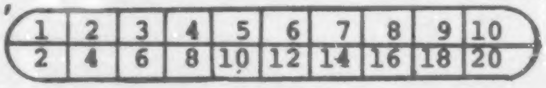
e.g.,



1	2	3	4	5	6	7	8	9	10

Say, "Write the numbers 1 through 10 on one stick, the multiples of two through twenty on the next stick until you have ten sticks each with a different set of multiples from 1 through 10."

e.g.,



1	2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20

Write the fraction $\frac{1}{2}$ on the chalkboard. Say, "Find the sticks that begin with 1 and 2." Demonstrate and say, "Line up the 1 and 2. (see above) Let's call the line with 1, the numerator, and the line with 2 as the first number, the denominator. What number is lined up with the 2 in the numerator? (4) $\frac{1}{2}$ is equivalent to $\frac{2}{4}$."

Repeat this procedure for other equivalent fractions.

STRATEGY 2: Prepare colored squares. Tape one red square and three blue ones on the chalkboard. Say, "For every red square, three blue squares are needed." Place another red square a small distance away from the other grouping. Say, "How many blue squares do I need?" (3) Match the three blue squares to the red square. Draw a chart on the chalkboard.

e.g.,

Red Squares	1	2	3	4	5	6	7	8	9	10
Blue Squares	3	6								

STRATEGY 2: cont'd

Say, "What information is in the top row of the chart? (number of red squares) What information is in the bottom row of the chart?" (number of blue squares) Point to the 1. Say, "How many red squares? (1) How many blue squares?" (3) Fill in the chart. Say, "If we match the pairs of numbers they will be equivalent fractions, e.g., $\frac{1}{3}$ is equivalent to $\frac{2}{6}$." Write $\frac{1}{3} = \frac{2}{6}$.

Repeat this procedure for other equivalent fractions.

4.06.08.02 **subtract fractions having unlike denominators**

STRATEGY 1: Prepare and distribute fractional parts. Say, "Find sixths and thirds." Write $\frac{5}{6} - \frac{1}{3}$ on the chalkboard. Say, "What are we supposed to do? (subtract) What must we do first? (Find an equivalent fraction for the $\frac{1}{3}$.) How many $\frac{1}{6}$ equal $\frac{1}{3}$?" (two) Write $\frac{5}{6} - \frac{2}{6}$ on the chalkboard. Ask a student to complete the subtraction.

Repeat this procedure.

STRATEGY 2: Prepare and distribute colored rods. Say, "Let the orange rod equal 1 whole, the yellow equal $\frac{1}{2}$ and the red equal $\frac{1}{4}$." Write $\frac{1}{2} - \frac{1}{4} = \square$ on the chalkboard. Ask a student to subtract. Say, "What must we do first? (Find a common denominator.) How many fourths equal $\frac{1}{2}$? (2) How can we show $\frac{2}{4}$?" (2 red rods) Ask a student to complete the subtraction.

Repeat this procedure.

4.06.08

4.06.08.03 **solve word problems related to skills learned in this module**

STRATEGY 1: Write on the chalkboard.

> Hazlene took $\frac{1}{2}$ cup of flour from a container holding $\frac{3}{4}$ cup. How much flour remained?

Say, "What information is given? (started with $\frac{3}{4}$ cup, removed $\frac{1}{2}$) What do we have to find? (The amount of flour left.) How can we do that?" (subtract) Write $\frac{3}{4} - \frac{1}{2}$ on the chalkboard. Say, "How can we change $\frac{1}{2}$ to fourths so we can subtract?" ($\frac{1}{2} = \frac{2}{4}$) Write $\frac{3}{4} - \frac{2}{4}$ on the chalkboard. Ask a student to subtract.

Repeat this procedure using other word problems.

STRATEGY 2: Write on the chalkboard.

> Jonathan lived $\frac{3}{5}$ of a mile from school. Ardyce lived $\frac{1}{10}$ of a mile from the school. How much further away did Jonathan live from the school than Ardyce?"

Say, "What are we supposed to find? (How much further away from the school Jonathan lives than Ardyce.) What operation can we use to find this information?" (subtraction) Write $\frac{3}{5} - \frac{1}{10}$ on the chalkboard. Say, "How can we subtract fractions with two different denominators? (Find the common denominator.) What is the common denominator for $\frac{3}{5}$ and $\frac{1}{10}$? (10) What is an equivalent fraction to $\frac{3}{5}$ with 10 in the denominator?" ($\frac{6}{10}$) Write $\frac{6}{10} - \frac{1}{10}$ on the chalkboard. Ask a student to complete the subtraction, e.g., $\frac{6}{10} - \frac{1}{10} = \frac{5}{10}$.

Repeat this procedure using other word problems.

P.O. 4.06.08.01

NAME:________________________________CLASS:__________DATE:________

Write the numerators for the equivalent fractions.

1	2	3	4	5	6	7	8	9	10
2	4	6	8	10	12	14	16	18	20

$\frac{1}{2} = \frac{2}{4}$ $\frac{1}{2} = \frac{\quad}{6}$ $\frac{1}{2} = \frac{\quad}{16}$

2	4	6	8	10	12	14	16	18	20
3	6	9	12	15	18	21	24	27	30

$\frac{2}{3} = \frac{\quad}{6}$ $\frac{2}{3} = \frac{\quad}{9}$ $\frac{2}{3} = \frac{\quad}{12}$

1	2	3	4	5	6	7	8	9	10
4	8	12	16	20	24	28	32	36	40

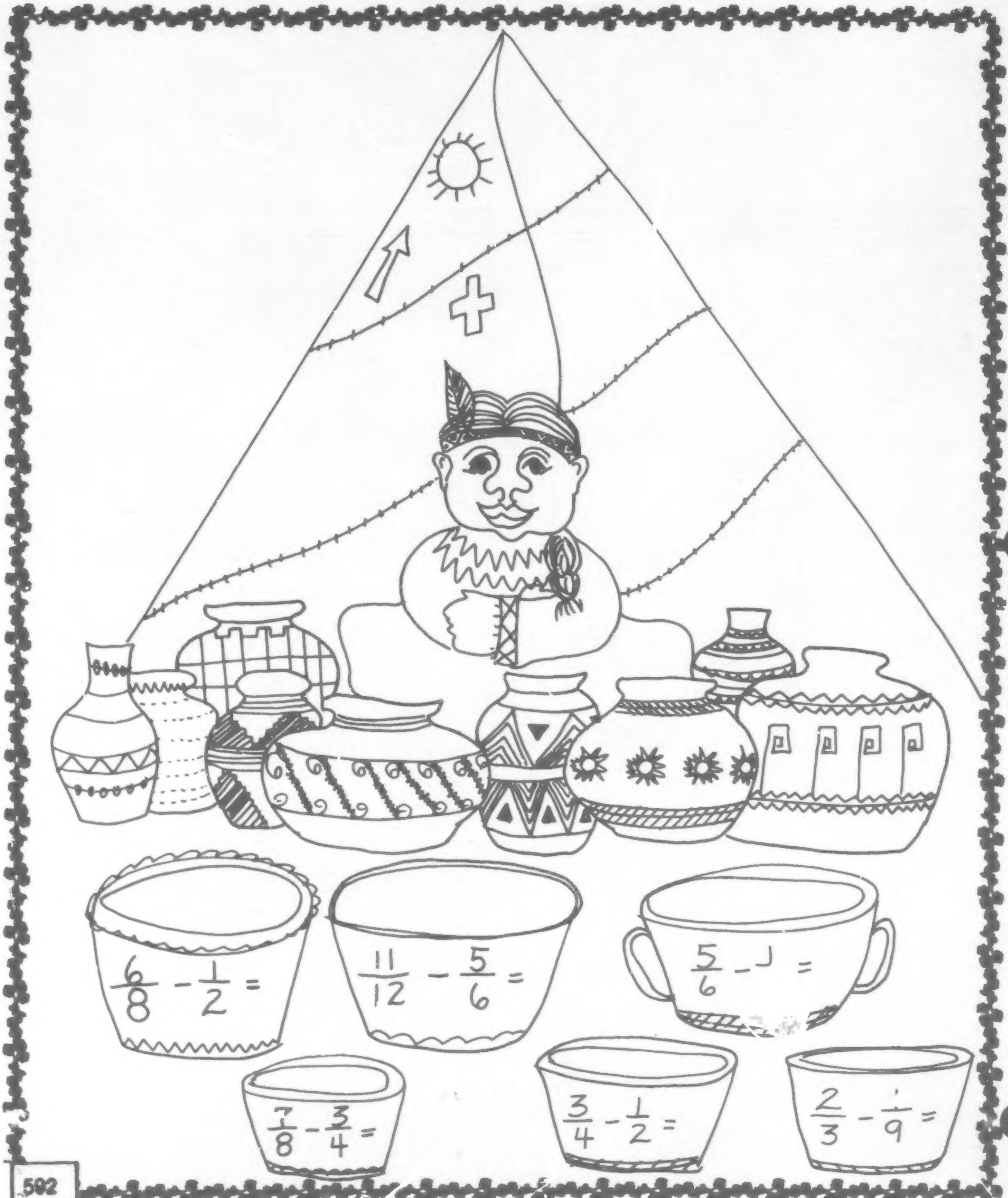
$\frac{1}{4} = \frac{\quad}{8}$ $\frac{1}{4} = \frac{\quad}{12}$ $\frac{1}{4} = \frac{\quad}{16}$

591

P.O. 4.06.08.02

NAME: ____________________ CLASS: __________ DATE: ________

Find the difference.


$\frac{6}{8} - \frac{1}{2} =$
$\frac{11}{12} - \frac{5}{6} =$
$\frac{5}{6}$ - J =
$\frac{7}{8} - \frac{3}{4} =$
$\frac{3}{4} - \frac{1}{2} =$
$\frac{2}{3} - \frac{1}{9} =$

502

P.O. 04.06.08.03

NAME:______________________________ CLASS:________ DATE:_______

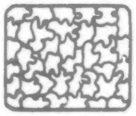
Find the difference.

1. Troy drew a line between the $\frac{5}{8}$" and $\frac{1}{4}$" markings on a ruler. How long was the line he drew?

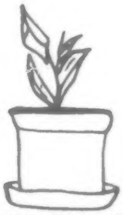
2. Phyllis ran $\frac{3}{4}$ mile. Andre ran $\frac{1}{2}$ mile. How much further did Phyllis run than Andre?

3. A container had $\frac{3}{4}$ quart of juice. Barbara spilled $\frac{1}{2}$ juice of a quart. How much juice was left?

4. Lonnie and Mandy put $\frac{7}{8}$ of a puzzle together. If Lonnie put $\frac{1}{4}$ of the puzzle together. What part did Mandy put together?



5. A plant measured $\frac{5}{8}$ inch in May and $\frac{15}{16}$ inch in June. How much did it grow?



4.12.04 STATISTICS

(2-3 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.12.04.01B

find the mean (average) from given data; e.g.,

The average of 124, 138 and 161 is:

$$\begin{array}{r} 124 \\ 138 \\ \underline{+161} \\ 423 \end{array} \qquad \begin{array}{r} 141 \\ 3\overline{)423} \end{array}$$

mean (Average) = 141

4.12.04.02B

identify the mode as the number that occurs most frequently;
e.g.,

Color	Tally	Frequency
Red	////	4
Blue	~~////~~	5

Blue is the mode since it is the color chosen most frequently.

4.12.04.03A

define range as the difference between the largest and the smallest numbers in a set.
e.g.,

The results of the test scores were: 100, 95, 90, 85, 80, 75, 65, 60, 55 and 40.
100 - 40 = 60 is the range for this class' test scores.

288

4.12.04

VOCABULARY

TERMS

average
mode
statistics
data
frequency
tally

GETTING STARTED

Write the following on the chalkboard. Connie's Math Grades: 70, 80, 75, 85. Say, "How do you think Connie is doing in Math? Is she passing? About where do you think most of her grades are? Is she failing? Are her grades in the nineties? Her grades are somewhere in the seventies."

Ask students to select their favorite video games. List the names of a few favorites on the chalkboard, e.g., Pac-Man, Donkey Kong, Mario Brothers. Say, "We would like to collect some data concerning our choice of games. How many students chose Pac-Man?" Ask a student to write the number on the chalkboard. Repeat this procedure for the other games. Ask a student to tally the data. Say, "What game was most frequently chosen?"

4.12.04

4.12.04.01 **find the mean (average) from given data**

STRATEGY 1: Say, "Sean bought two comic books on Monday, one on Wednesday and three on Saturday. What was the average number of comic books he bought on any given day?" Write the following the chalkboard.

Day	Number of Comic Books

Ask a student to fill in the chart. Say, "How many books did he buy in all? (6) How many days did he buy books? (3) To find the average number of books he bought, divide the total number of books by the number of days he made purchases. To find an average, first we add the number of books." Write $2 + 1 + 3 = 6$ on the chalkboard. Say, "Divide by the total number of days." Write $\begin{array}{r}2\\3\overline{)6}\end{array}$ on the chalkboard. Say, "2 is the average or mean number of books Sean bought."

STRATEGY 2: Write the following on the chalkboard.

> The fourth grade collected toys to give to a hospital. Class 4-401 collected 30 toys, 4-402 collected 20 toys, Class 4-403 collected 15 and 4-404 collected 35. What was the average number of toys each class collected?

Class	Number of Toys

Ask a student to fill in the table. Say, "To find an average, add the number of toys and divide the sum by the number of classes." Write the following on the chalkboard.

$30 + 20 + 15 + 35 = \square \qquad 4\overline{)}$

Ask a student to find the sum. Ask another student to write the sum in the division example as the dividend. Ask a third student to complete the division. Say, "The average number of toys collected by each class was 25. The mean was 25. Mean and average mean the same thing."

4.12.04

4.12.04.02 define the mode as the number that occurs most frequently

STRATEGY 1: Prepare boxes of crayons with three colors, e.g., red, blue, and yellow. Say, "Each student may choose one crayon. To collect data about the choice of colors, we will make a chart listing the colors on the chalkboard. Raise your hand if you chose red." Ask a student to count the number of hands and another student to keep a tally at the chalkboard. Repeat this procedure for the other colors.

e.g.,

Color	Tally	Frequency
Red		9
Blue		14
Yellow		6

Ask individual students to come to the chalkboard to find the frequency for each color. Say, "What color was chosen most frequently? (blue) We say that blue is the mode as it was chosen most frequently. The mode is the same as the frequency."

STRATEGY 2: Say, "I want to collect data about favorite flavors of ice cream. Let's tally the numbers for each flavor." Draw a chart on the chalkboard and ask the students to select their favorite flavor.

e.g.,

Flavor	Tally
Chocolate	
Strawberry	
Vanilla	

Ask individual students to come up to tally the choices. Say, "The flavor chosen most often is the mode. What flavor was chosen most often or most frequently?"

4.12.04

4.12.04.03 define range as the difference between the largest and smallest numbers in a set

STRATEGY 1: Ask nine students to come to the front of the room. Say, "I want to find out how tall you are." Ask students to stand against a height chart. Ask other students to measure their classmates' heights. List the heights of the students on the chalkboard.

e.g.,

54", 50", 60", 48", 51", 59", 49", 53".

Say, "What is the height of the shortest student? (48") What is the height of the tallest student? (60") The range for the height of these students is the difference between the lowest height and the greatest height. What is the difference?" (12")

STRATEGY 2: Say, "I often hear the weatherperson talk about the range in temperature. I would like to learn what this means." Use a large thermometer. Say, "It was 65° on Monday." Write 65° on the chalkboard. Repeat this procedure for 70° on Tuesday, 60° on Wednesday, 68° on Thursday, 64° on Friday. Say, "To find the range, we find the difference between the highest temperature and the lowest. What is this difference?" (70° - 60° = 10°)

P.O. 4.12.04.01

NAME: ______________________ CLASS: __________ DATE: ________

Find the average.

①

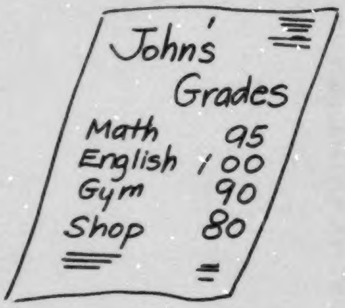
A. 7
2
+6
15

$\begin{array}{r} 5 \\ 3\overline{)15} \end{array}$

②

4
3
5

$3\overline{)}$



John's Grades

Math	95
English	100
Gym	90
Shop	80

③

8
1
+6

$3\overline{)}$

④

7
4
+7

$\overline{)}$

⑤

9
1
8

$\overline{)}$

⑥

23
+13

$\overline{)}$

⑦

12
15
+21

⑧

23
12
+15

$\overline{)}$

⑨

15
12
+15

$\overline{)}$

⑩

3
4
5
+8

$4\overline{)}$

⑪

13
12
9
14

P.O. 4.12.04.02

NAME:________________________ CLASS:__________ DATE:________

Identify the mode in each table.

Tally	Frequency
𝍷𝍷𝍷𝍷	4
𝍸	____
𝍸 𝍷𝍷𝍷	____
𝍸 𝍸	____
𝍷𝍷	____

Tally	Frequency
𝍸𝍸 𝍷𝍷	____
𝍸𝍸 𝍷	____
𝍸𝍸 𝍷𝍷𝍷	____
𝍸 𝍸𝍸	____
𝍸𝍸𝍸𝍸	____

Flavor	Tally	Frequency
Chocolate	𝍸 𝍸	10
Cherry	𝍷𝍷𝍷𝍷	4
Vanilla	𝍸 𝍷	6

The mode is ________

Games Won

Team	Tally	Frequency
Mets	𝍸 𝍷𝍷𝍷	8
Yankees	𝍸	5
Dodgers	𝍸 𝍷	6

The mode is ________

Grade	Tally	Frequency
70	𝍸 𝍷𝍷𝍷	____
80	𝍸 𝍸	____
60	𝍷𝍷𝍷	____
90	𝍸 𝍷	____

The mode is ______

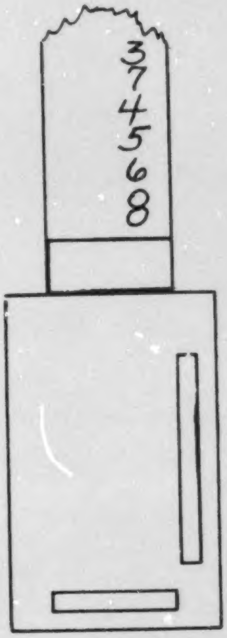
Pets We Own	Tally	Frequency
Dogs	𝍸𝍸 𝍷𝍷𝍷	____
Cats	𝍸𝍸 𝍷	____
Birds	𝍷𝍷𝍷	____
Fish	𝍸 𝍷	____

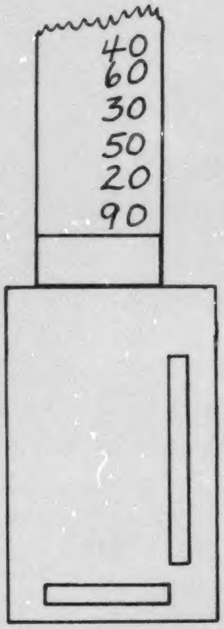
The mode is ______

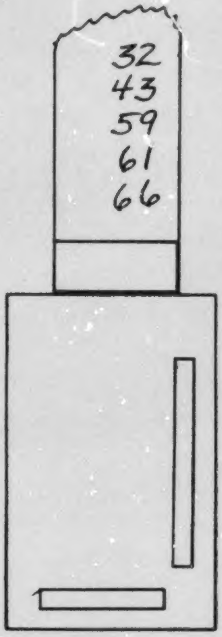
P.O. 4.12.04.03

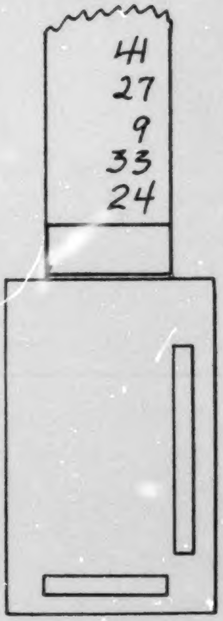
NAME: ________________________ CLASS: ________ DATE: ________

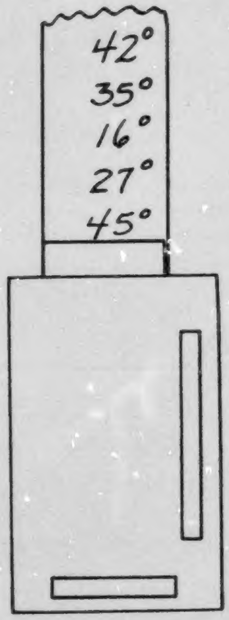
Find the range .
Write the range for each group.

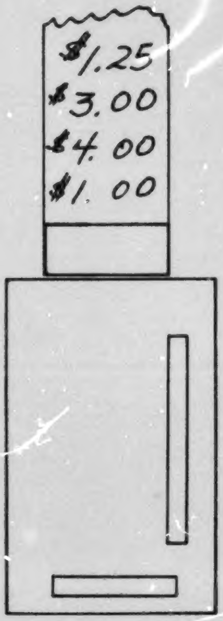



40
60
30
50
20
90


32
43
59
61
66




42°
35°
16°
27°
45°


$1.25
$3.00
$4.00
$1.00

4.04.04 MULTIPLICATION OF 2-DIGIT NUMBERS

(1 lesson)

PERFORMANCE OBJECTIVES

The student will be able to...

4.04.04.01B multiply 10, and multiples of 10, by 10 and multiples of 10;

e.g.,

$$\begin{array}{r} 50 \\ \underline{\text{x}10} \\ 500 \end{array}$$

4.04.04.02B multiply a 2-digit number by a 2-digit number without regrouping;

e.g.,

12 x 34 = 408

$$\begin{array}{rl} 34 & \\ \underline{\text{x}12} & \\ 68 & \longrightarrow (\ 2 \text{ x } 34) \\ \underline{340} & \longrightarrow (10 \text{ x } 34) \\ 408 & \end{array}$$

4.04.04.03A multiply a 2-digit number by a 2-digit number with regrouping;

e.g.,

49 x 52 = 2,548

$$\begin{array}{rl} 52 & \\ \underline{\text{x}49} & \\ 468 & \longrightarrow (\ 9 \text{ x } 52) \\ \underline{2\ 080} & \longrightarrow (40 \text{ x } 52) \\ 2{,}548 & \end{array}$$

4.04.04.04A solve word problems related to skills learned in this module.

e.g.,

There are 12 eggs in one carton. How many eggs are there in 68 cartons?

12 x 68 = 816 eggs

$$\begin{array}{rl} 68 & \\ \underline{\text{x}12} & \\ 136 & \longrightarrow (\ 2 \text{ x } 68) \\ \underline{680} & \longrightarrow (10 \text{ x } 68) \\ 816 & \quad \text{eggs} \end{array}$$

GETTING STARTED

Say, "We are two factors. Our products is 6. Who are we? What strategy will we use to solve the problem? (Prepare a list of factors that equal 6.) Our answer could be 1 and 6, or 2 and 3."

Repeat this procedure using other numbers.

Play "Buzz". Ask a student to start counting by ones. Everytime a student reaches 10, or a multiple of ten, the student must say Buzz.

e.g.,

1, 2, 3, 4, 5, 6, 7, 8, 9, Buzz, 11...

4.04.04

4.04.04.01 multiply 10, and multiples of 10, by 10 and multiples of 10

STRATEGY 1: Say, "Draw a 10 x 10 grid. How many squares are inside the grid?" (100) Write $\begin{array}{r}10\\ \underline{\times 10}\end{array}$ on the chalkboard. Ask a student to solve. Say, "What can we say about the product when both factors are multiples of ten? (The product has three places and has two zeros.) Where are the zeros? (ones place and tens place) The digit in the hundreds place is the result of multiplying the two non-zero factors." Repeat this procedure for multiples of ten.

STRATEGY 2: Adapt Strategy 2 used in P.O. 4.04.03.01.

4.04.04.02 multiply a 2-digit number by a 2-digit number without regrouping

STRATEGY 1: Write $\begin{array}{r}24\\ \underline{\times 12}\end{array}$ on the chalkboard. Say, "We can solve multiplication problems very easily if we remember three very important steps." Write the following on the chalkboard.

e.g.,

$$\begin{array}{r}24\\ \underline{\times 2}\\ \overline{48}\end{array}\qquad\begin{array}{r}24\\ \underline{\times 10}\\ \overline{240}\end{array}\qquad\begin{array}{r}48\\ \underline{+240}\\ 288\end{array}$$

Rename 12 as 10 + 2. Write two multiplication examples. Solve. Add the products. Say, "We can solve this problem using the multiplication short cut." Rewrite $\begin{array}{r}24\\ \underline{\times 12}\end{array}$ on the chalkboard. Say, "Step 1, multiply by the ones column. Step 2, multiply by the tens column. Step 3, add. The product for 24 X 12, using the short cut, is the same product we found when we renamed 12 as 10 + 2. The factors are the same so the products are the same."

Repeat this procedure using other examples.

4.04.04

STRATEGY 2: Write this problem on the chalkboard.

e.g.,

$$\begin{array}{r l}
21 & \\
\underline{\times 14} & \\
84 & \longrightarrow (4\times 21) \\
\underline{210} & \longrightarrow (10\times 21) \\
294 &
\end{array}$$

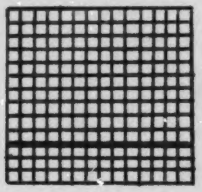
Say, "First multiply by 4. Then multiply by 10. Add the two partial products."

Repeat this procedure using other examples.

4.04.04.03 **multiply a 2-digit number by a 2-digit number with regrouping**

STRATEGY 1: Display a 13 x 14 array on graph paper taped to the chalkboard.

e.g.,



Say, "This array shows 13 x 14. To solve this problem we separate the 13 rows into 10 rows and 3 rows."

Write the example on the chalkboard.

e.g.,

$$\begin{array}{r c r c r c l}
14 & & 14 & & 14 & & \\
\underline{\times 13} & = & \underline{\times 3} & + & \underline{\times 10} & & \\
 & & 42 & + & 140 & = & 182
\end{array}$$

Say, "We need three steps to solve the example." Complete the example as you explain the steps. Say, "Multiply by 3. Exchange 12 ones for 1 ten and 2 ones. Multiply 3 x 10 = 30 + 10 = 40. We write the 4 in the tens place. Now we multiply by

STRATEGY 1: cont'd

10. When you multiply by 10, put a zero in the ones place. Multiply 14 x 1 and write the answer, 14, next to the zero. Add the partial products. We can also do this example a short way. Multiply 14 x 3, then 14 x 10, and add."

e.g.,

```
                14
               x13
Step 1          42 ---->  (3 x 14)
Step 2         140 ---->  (10 x 14)
Step 3         182
```

Repeat this procedure using other problems.

STRATEGY 2: Say, "There are 37 cookies on one tray. How many cookies are there on 24 trays? Solve this problem by multiplying."

Write 37 on the chalkboard.

```
 x24
 148
 740
 888
```

Say, "First we multiply 4 x 7." Ask the students to explain the regrouping as you do the work on the chalkboard. Say, "Next we multiply 4 x 30. Place a zero in the ones place to indicate we are multiplying by a multiple of 10. Then multiply 2 x 7 = 14. Regroup ten ones as 1 ten and 2 x 3 + 1 = 7. Write 74 next to the zero." Ask a student to add the partial products.

Repeat this procedure using other examples.

4.04.04.04 **solve word problems related to skills learned in this module**

STRATEGY 1: Say, "There are 12 trailers. Each trailer holds 26 motorcycles. How many motorcycles are there in all? What operation will we use to solve the

4.04.04

STRATEGY 1: cont'd

problem?" (multiplication) Write the following on the chalkboard.

e.g.,

$$\begin{array}{rl} 26 & \\ \underline{\times 12} & \\ 52 & \longrightarrow \ (2 \times 26) \\ \underline{260} & \longrightarrow \ (10 \times 26) \\ 312 & \end{array}$$

Ask a student to come to the chalkboard and complete the problem while the rest of the class does the work at their seats.

Repeat this procedure using other problems.

STRATEGY 2:

Draw a grid showing 12 rows with 25 rectangles in each row. Say, "This grid represents a small auditorium. It has 12 rows with 25 seats in each row. How many people can be seated in this auditorium? What operation shall we use?" (multiplication) Draw a line under the tenth row of the grid. On the chalkboard, write the following.

e.g.,

$$\text{(A)} \begin{array}{r} 25 \\ \underline{\times 12} \end{array} = \quad \text{(B)} \begin{array}{r} 25 \\ \underline{\times 10} \\ \boxed{} \end{array} \begin{array}{c} + \\ + \end{array} \quad \text{(C)} \begin{array}{r} 25 \\ \underline{\times 2} \\ \boxed{} \end{array} = \boxed{}$$

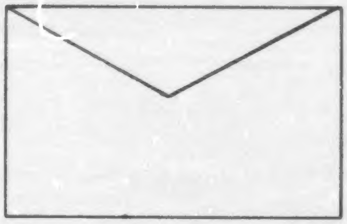
Ask a student to go to the chalkboard and fill in the empty boxes for examples B and C. Then ask another student to complete example A.

Repeat this procedure using other problems.

P.O. 4.04.04.01

NAME: ______________________________ CLASS: __________ DATE: ________

Multiply. Use the key to solve the riddle.



What begins with "e" and ends with "e" and has only one letter in it?

① 20 X10 200	② 20 X20	③ 30 X20	④ 40 X10	⑤ 70 X10
⑥ 60 X10	⑦ 10 X10	⑧ 30 X10	⑨ 50 X10	⑩ 20 X30

Key

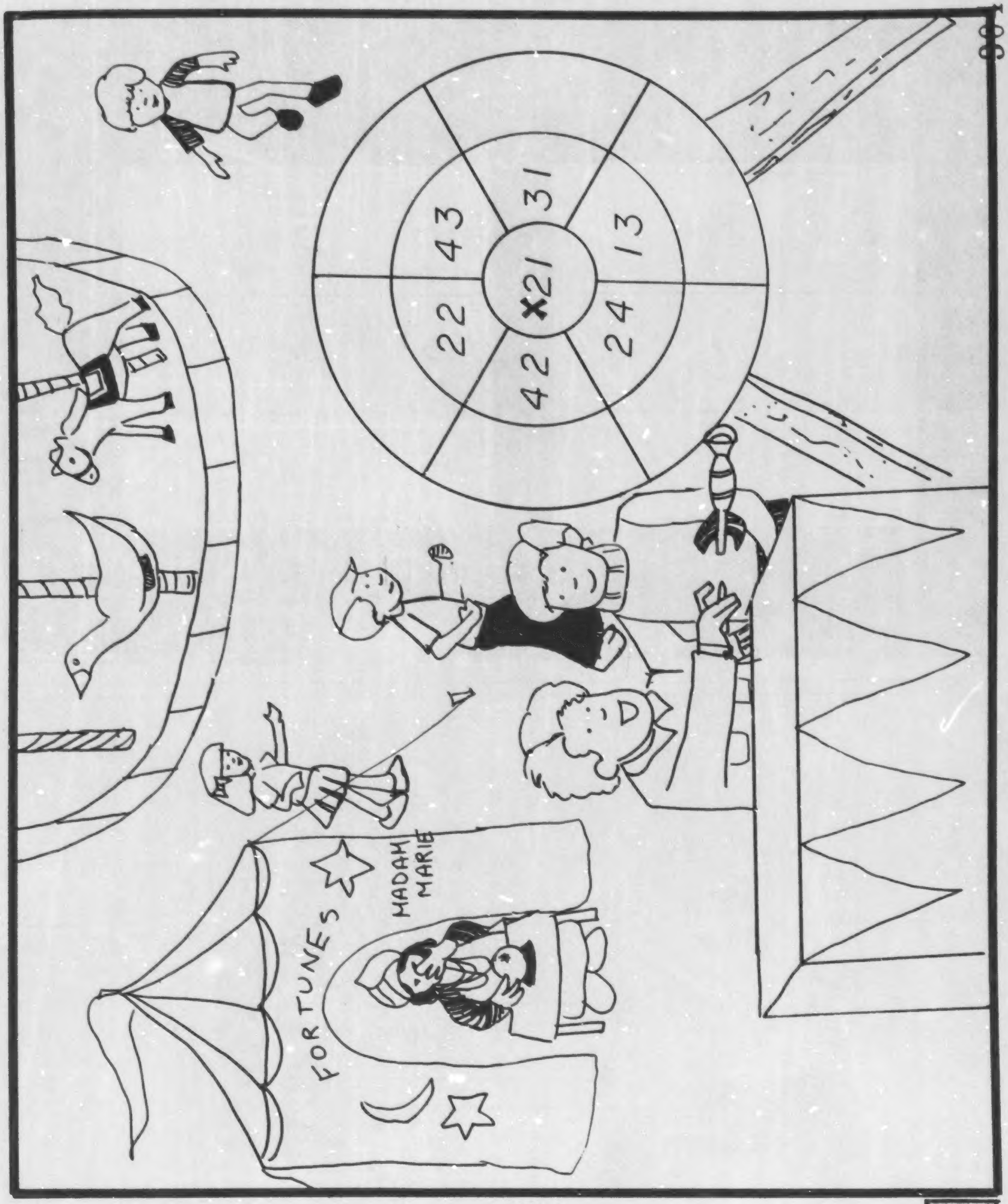
A	E	L	N	O	P	V
200	600	100	400	300	500	700

1	2	3	4	5	6	7	8	9	10
A									

P.O. 4.04.04.02

NAME:____________________________________CLASS:_________DATE:_______

Find each product to complete the multplication wheel.



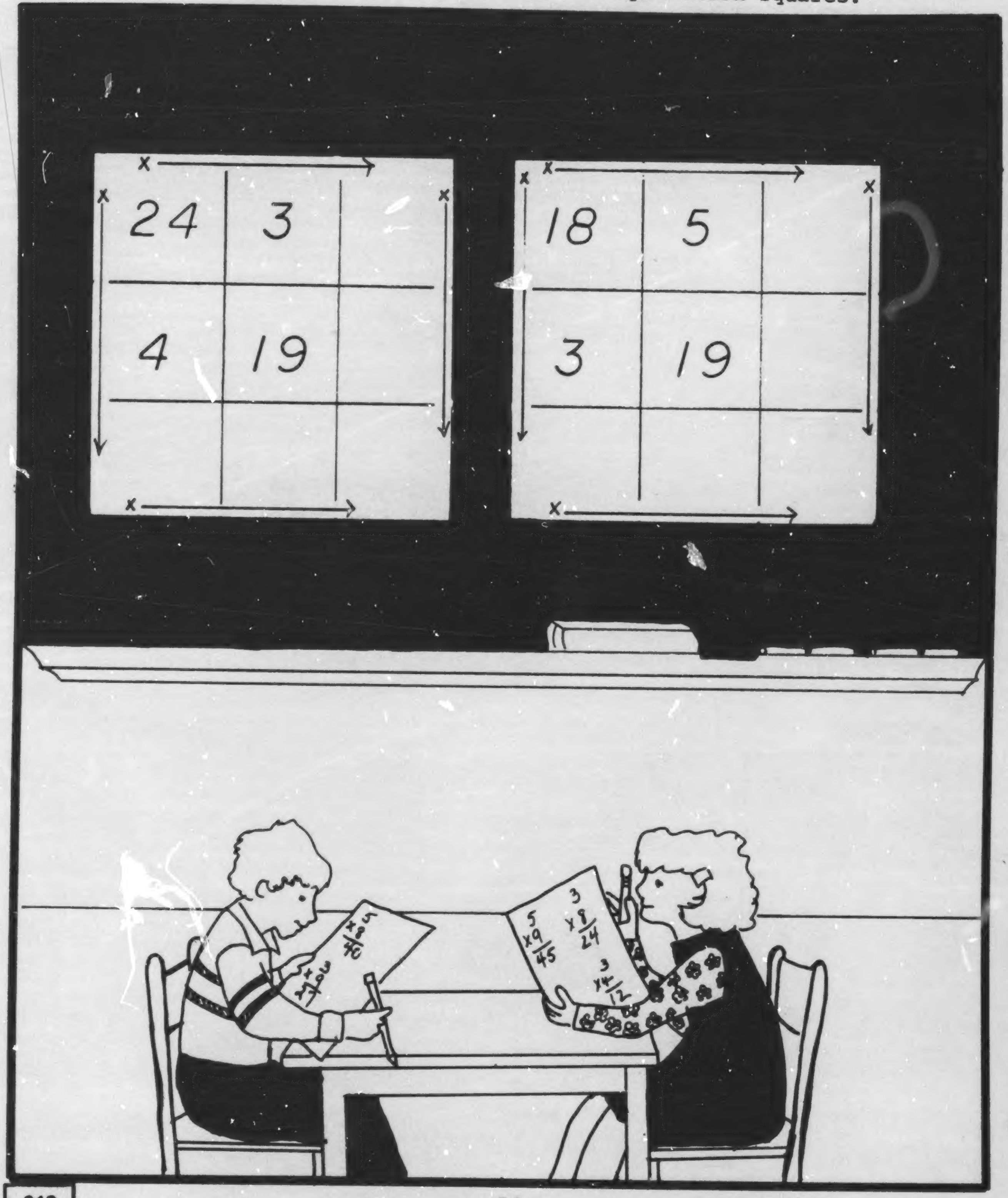
FORTUNES
MADAM MARIE
×21
22
43
31
13
24
42

304

P.O. 4.04.04.03

NAME:____________________________________ CLASS:________ DATE:________

Find each product to complete the multiplication squares.

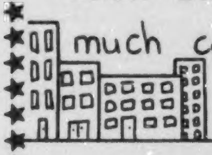

x
x
x
x
24
3
4
19
x
x
x
x
18
5
3
19
5
x9
45
3
x8
24
3
x4
12

P.O. 4.04.04.04

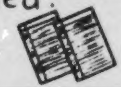
NAME: ______________________ CLASS: ________ DATE: ______

I. Read each problem.
II. Solve the problem.
III. Label your answer.

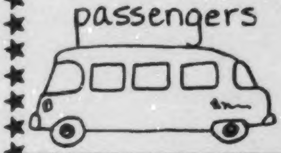
1. The engineer said that he needed 18 tons of concrete for each building. His company is constructing 36 buildings. How much concrete will be needed in all?



2. The 5th grade needed 24 sheets of paper for each student. If there are 56 students, how many sheets of paper will be needed?



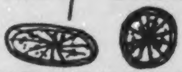
3. Each of 43 school buses carries 28 passengers. How many passengers can all 43 school buses carry?



4. 58 youngsters went to the party. 29 went home early. How many youngsters stayed at the party?

5. Mr. Jones sold 43 footballs on Monday and 29 footballs on Tuesday. How many footballs did he sell on both days?

6. The football team won the championship. To celebrate, 32 pizzas were ordered. Each pizza was cut into 12 slices. How many slices were there?



Unit 65

4.04.05 MULTIPLICATION OF A 3-DIGIT NUMBER BY A 2-DIGIT NUMBER

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.04.05.01B multiply 100 and multiples of 100 by 10 and multiples of 10;

e.g.,

$$\begin{array}{r} 200 \\ \times\ \ 30 \\ \hline 6{,}000 \end{array}$$

4.04.05.02B multiply a 3-digit number by a 2-digit number;

e.g.,

$$\begin{array}{rl} 412 & \\ \times\ 22 & \\ \hline 824 & \longrightarrow\ \ (2 \times 412) \\ 8\ 240 & \longrightarrow (20 \times 412) \\ \hline 9{,}064 & \end{array}$$

4.04.05.03A solve word problems related to skills learned in this module.

e.g.,

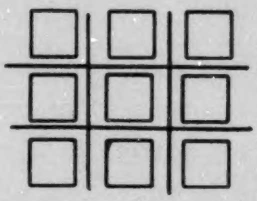
Marie can type 110 words a minute. How many words can she type in 12 minutes?

$$\begin{array}{rl} 110 & \\ \times 12 & \\ \hline 220 & \longrightarrow\ \ (2 \times 110) \\ 1\ 100 & \longrightarrow (10 \times 110) \\ \hline 1{,}320 & \text{minutes} \end{array}$$

GETTING STARTED

Prepare a set of multiplication fact cards. Draw a tic-tac-toe board on the chalkboard. Tape the fact cards, face down, on the game board.

e.g.,



Divide the class into two teams. Team X chooses a square. Display the fact card, e.g., 6 x 6 . If the first student on Team X answers correctly, remove the card and place an X in that square. If the answer is incorrect, the square belongs to Team 0. Play continues moving from team to team until one team has tic-tac-toe.

Prepare approximately 40 multiplication cards.

e.g.,

30 X 12

40 X 37

Say, "Let's play 'Estimation Bee'." Divide the class into two teams. Ask each team to stand in a line on opposite sides of the room. Show the top problem card to each team. If the team member gives the correct estimate, he or she goes to the back of the line. If the estimate is incorrect, the team member sits down. The team with the greatest number of members standing at the agreed upon time wins the game.

4.04.05

4.04.05.01 **multiply 100 and multiples of 100 by 10 and multiples of 10**

STRATEGY 1: Write the following examples on the chalkboard.

e.g.,

$$\begin{array}{r} 100 \\ \underline{x10} \\ 1000 \end{array} \qquad \begin{array}{r} 100 \\ \underline{x20} \\ 2000 \end{array} \qquad \begin{array}{r} 100 \\ \underline{x30} \\ 3000 \end{array}$$

Say, "Look at the factors and the products. What can we say about the products when one factor is a multiple of 100 and one factor is a multiple of 10? (There is a zero in the ones, tens and hundreds place.) The digit in the thousands place is a result of multiplying the 2 non-zero digits."

Continue this procedure using other multiples of 10 and 100.

STRATEGY 2: Adapt Strategy 1 used in P.O. 4.04.04.01.

4.04.05.02 **multiply a 3-digit number by a 2-digit number**

STRATEGY 1: Say, "The factory packed 234 footballs in each large crate. How many footballs were packed in 38 crates? We can solve the problem using multiplication." Elicit and write the problem on the chalkboard.

e.g.,

$$\begin{array}{r} 234 \\ \underline{x38} \end{array} = \begin{array}{r} 234 \\ \underline{x30} \end{array} + \begin{array}{r} 234 \\ \underline{x\ 8} \end{array}$$

Complete the examples with the class. Stress the regroupings as they occur. Say, "There is a shorter way to multiply. First we multiply by the digit in the ones place, remembering to add the numbers that were regrouped. Multiply by the digit in the tens place. Remember to add the regrouped

STRATEGY 1: cont'd

numbers. Place a zero in the ones place to indicate you are multiplying by tens."

e.g.,

$$\begin{array}{rl} 234 & \\ \underline{\times 38} & \\ 1,872 & \longrightarrow (8 \times 234) \\ \underline{7,020} & \longrightarrow (30 \times 234) \\ 8,892 & \end{array}$$

Repeat this procedure using other examples.

STRATEGY 2: Draw a place value chart on the chalkboard.

e.g.,

Th	H	T	O	
	2	4	3	
	x	3	5	
1	2	1	5	——> (5 x 243)
7	2	9	0	——> (30 x 243)
9,	5	0	5	

Ask a student to find the product of 243 X 5. Point out each regrouping as it occurs. Say, "When you multiply by 30, put a zero in the ones place and continue to multiply. Add the products."

Repeat this procedure using other problems with and without regrouping.

4.04.05.03 solve word problems related to skills learned in this module

STRATEGY 1: Write the following problem on the chalkboard.

e.g.,

> Last week Mr. Smith sold 127 vanilla ice cream cones. He sold 16 times as many chocolate cones. How many chocolate cones did Mr. Smith sell?

Say, "What operation will you use to solve this problem?" (multiplication) Ask a student to come to the chalkboard and solve the problem while the

STRATEGY 1: cont'd

other students work at their seats.

e.g.,

 127
 x16
 762 ——> (6 x 127)
1 270 ——> (10 x 127)
2,032 chocolate cones

Repeat this procedure using other problems.

STRATEGY 2:

Prepare a large chart.

e.g.,

258	258	258	258	258	258
258	258	258	258	258	258

Say, "This chart shows 12 factories. Every day 258 cars are manufactured in each factory. How many cars are manufactured each day in all 12 factories? What operation will you use to solve this problem?" (multiplication) Ask a student to come to the chalkboard and solve the problem while the other students work at their seats.

e.g.,

 258
 x12
 516 ——> (2 x 258)
2 580 ——> (10 x 258)
3,096 cars

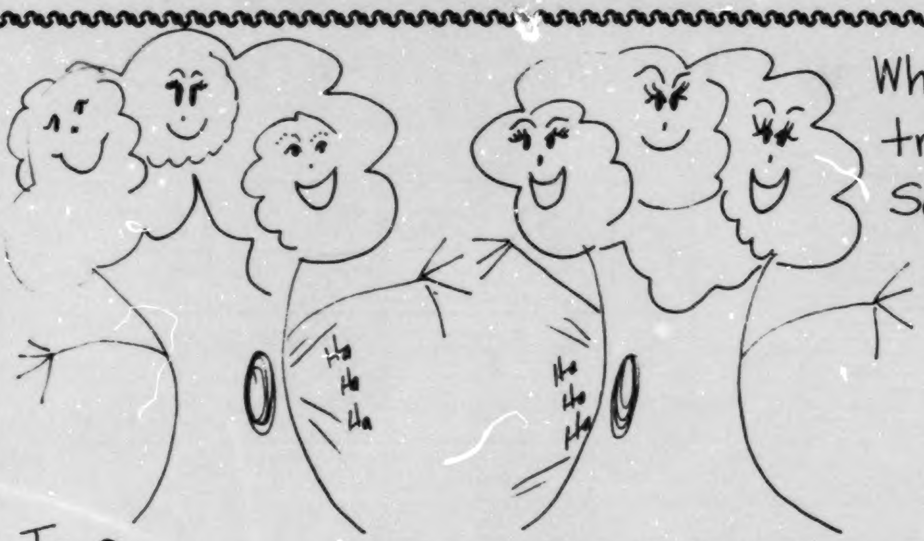
Repeat this procedure using other problems.

016

P.O. 4.04.05.01

NAME: ________________________ CLASS: __________ DATE: ________

Multiply. Use the key to solve the riddle.



Where does a tree go on Saturday night?

To a ___ ___ ___ ___ ___ ___   ___ ___ ___ ___ ___
1 2 3 4 5 6   7 8 9 10 11

①	②	③	④	⑤	⑥
100 X 10 1000 L	200 X 10	300 X 20	40 X 30	500 X 10	600 X 20

⑦	⑧	⑨	⑩	⑪
700 X 10	300 X 30	300 X 40	400 X 10	900 X 10

Key

A	B	E	L	M	P	R	T	U	Y
9000	1200	5000	1000	6000	7000	12,000	4000	2000	7000

P.O. 4.04.05.02

NAME:______________________________ CLASS:________ DATE:________

Solve. Use the key to solve the riddle.

How does KING KONG like his steak?

A	15,834	M	5,060
D	15,300	O	11,997
E	18,126	R	17,424
I	16,102	U	19,142

① 230 × 22

460
+4600
5060

② 318 × 57

③ 425 × 36

④ 194 × 83

⑤ 563 × 34

⑥ 460 × 11

⑦ 484 × 36

⑧ 279 × 43

⑨ 754 × 21

⑩ 968 × 18

M ___ ___ ___ ___ ___   ___ ___ ___ ___

1 2 3 4 5 6   7 8 9 10

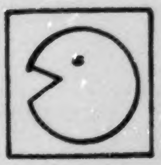
618

P.O. 4.04.05.03

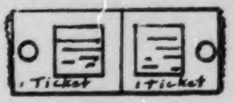
NAME:______________________________ CLASS:________ DATE:________

Solve each problem.

1. 429 video games are manufactured in one day. How many video games are manufactured in 34 days?



2. 564 tickets were sold to the football game in one hour. How many tickets were sold in 16 hours?



3. 398 youngsters and 73 parents went to the home team game. Three times as many people went to the game last year. How many people went to the game last year?

4. John ran 397 yards, Mike ran 26 times as far. How far did Mike run?

5. A bakery bakes 613 cakes a week. How many cakes were baked in 52 weeks?

6. Ann and Mary are going on a trip. They will travel 145 miles each day. How far will they go in 23 days?

Unit 66

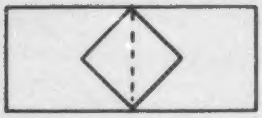
4.09.07 SYMMETRY

(1-2 lessons)

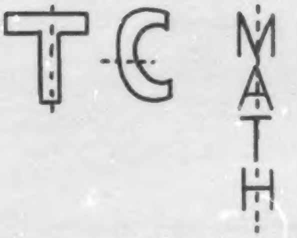
PERFORMANCE OBJECTIVES

The student will be able to...

4.09.07.01A recognize lines of symmetry; e.g.,



4.09.07.02A recognize lines of symmetry in objects other than geometric shapes. e.g.,



4.09.07

VOCABULARY

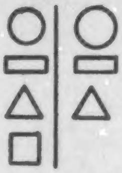
TERMS

fold
symmetry
symmetrical

GETTING STARTED

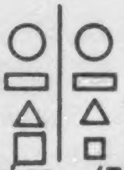
Distribute attribute blocks to groups of students (or prepare felt cutouts of geometric shapes for the flannel board, two of each shape) and 8" X 10" paper. Ask students to fold his/her paper in half. Say, "Let's make a design." Ask students to arrange their shapes.

e.g.,



Say, "What is different about these designs? (One side is missing a square.) Copy this design."

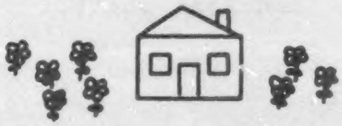
e.g.,



Say, "Tell me about this design. (Each side has a circle, rectangle, triangle, square, but the squares are not the same size.) Arrange both sides of the design so that they are exactly alike."

Distribute crayons and 8" X 10" unruled paper. Ask students to fold the paper. Say, "Draw a house in the center. Draw five flowers on one side and three flowers on the other side." Ask a student to draw it on the chalkboard.

e.g.,



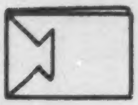
Say, "There are more flowers on one side than on the other. Turn your paper over and draw the house in the center. Draw five large flowers on one side and five small flowers on the other side. Now we have the same number of flowers on each side, but they are still not exactly the same."

4.09.07

4.09.07.01 recognize the lines of symmetry

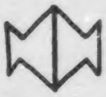
STRATEGY 1: Prepare and distribute sheets of construction paper and scissors. Ask the students to fold the piece of paper in half. Say, "Draw an outline of a shape along the fold.

e.g.,



Cut out the shape. Open it and darken the fold line.

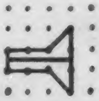
e.g.,



Do the two sides match? What part of the shape appears on each side of the fold? When one part of a shape is a mirror image of the other part, we call the shape symmetrical. The fold is the line of symmetry. Find other lines of symmetry in your shape."

STRATEGY 2: Prepare and distribute dot paper. Ask the students to draw a shape on the dot paper. Say, "Show the line of symmetry by drawing a line that will divide the shape so that each side is exactly the same. The line of symmetry is the line that cuts the shape into two identical parts."

e.g.,

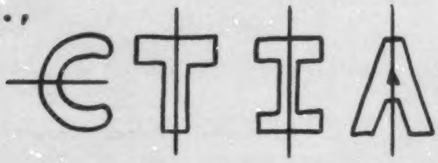


Repeat this procedure using other shapes.

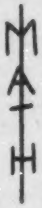
4.09.07

4.09.07.02 recognize lines of symmetry in objects other than geometric shapes

STRATEGY 1: Ask the students to print the alphabet using capital letters. Say, "Find the letters that have lines of symmetry. Draw the lines of symmetry."
e.g.,



Ask the students to print words that are symmetrical and show the line of symmetry.
e.g.,

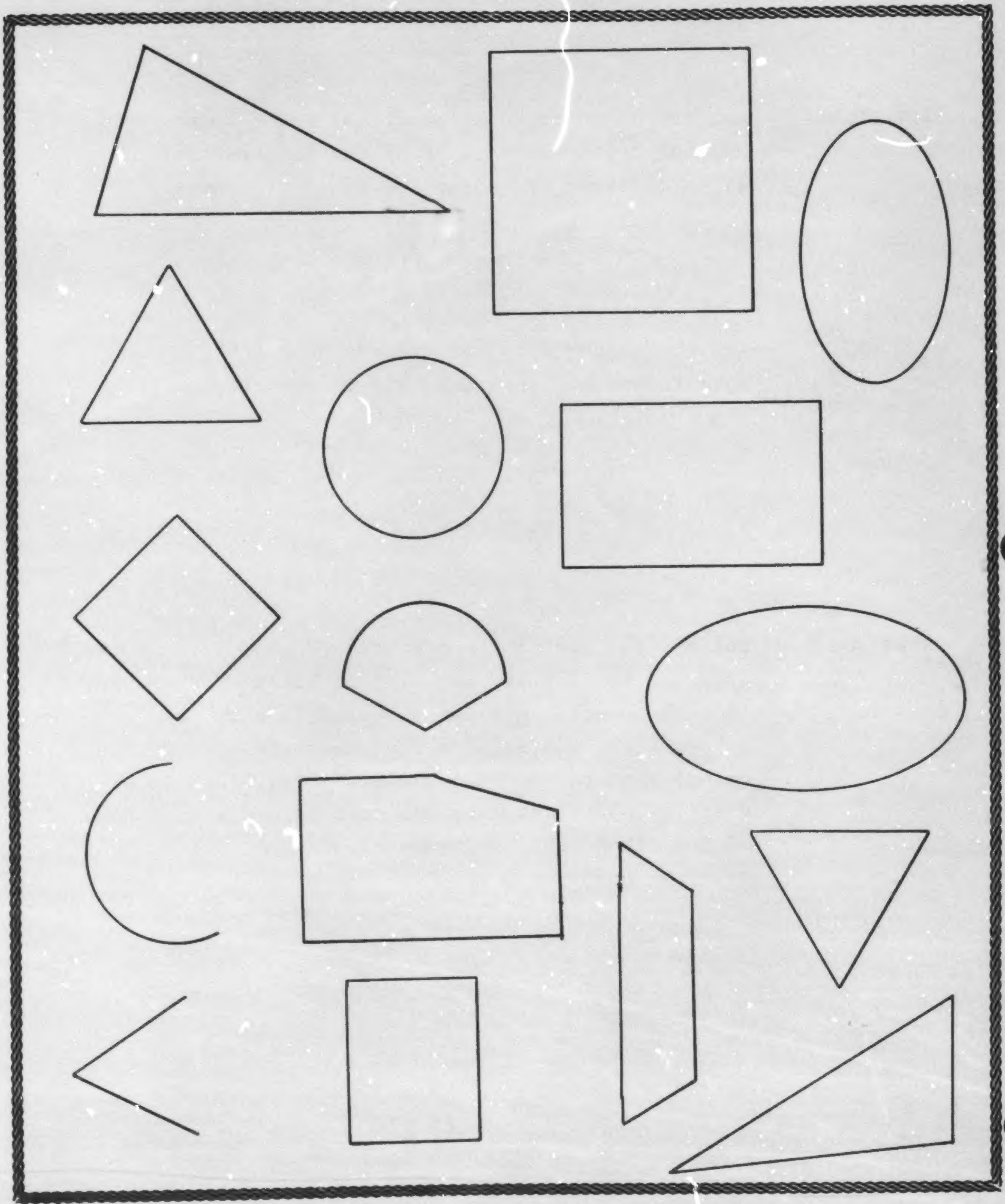


STRATEGY 2: Collect and distribute pictures of objects. Ask the students to identify the line or lines of symmetry in each object. Ask the students to show the line of symmetry by drawing a line that will divide the object into two identical parts. Say, "How do we describe something when one part is a mirror image of the other part?" (symmetrical)

P.O. 4.09.07.01

NAME: ________________________ **CLASS:** ________ **DATE:** _______

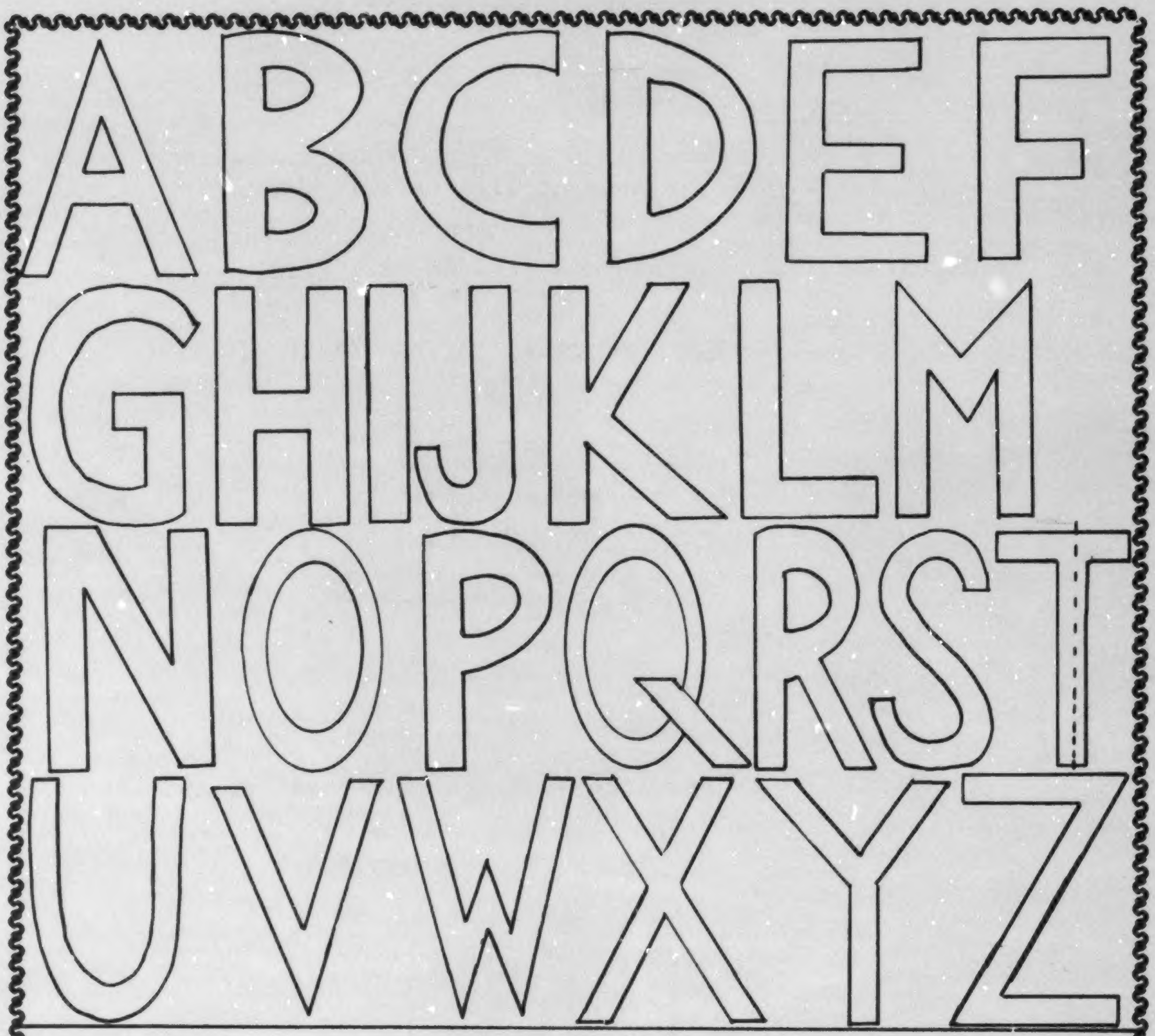
Draw a line or lines of symmetry in each shape.



P.O. 4.09.07.02

NAME: ________________ CLASS: ________ DATE: ________

1) Find the letters which have lines of symmetry. Draw the line.
2) Print two words that are symmetrical.


ABCDEF
GHIJKLM
NOPQRST
UVWXYZ

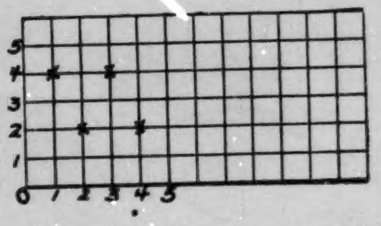
4.09.08 COORDINATE GEOMETRY

(1-2 lessons)

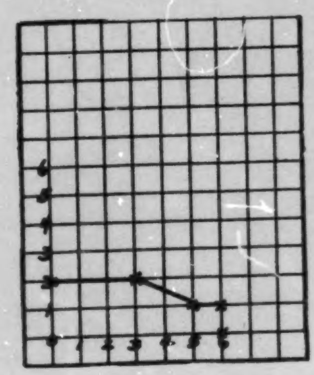
PERFORMANCE OBJECTIVES

The student will be able to...

4.09.08.01B locate coordinates on a grid;
e.g.,
(1,4) (2,2) (4,2) (3,4)


5
4
3
2
1
0
1
2
3
4
5

4.09.08.02B use line segments to connect points.
e.g.,
(6,1) (6.0) (5,1) (3,2) (0,2)


6
5
4
3
2
1
0
1
2
3
4
5
6

321

4.09.08

VOCABULARY

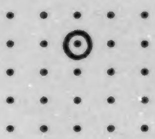
TERMS

horizontal
vertical
point
line segment
coordinate

GETTING STARTED

Distribute bead boards to students. Say, "We want to locate a special bead. The bead is located at the 3rd space horizontally and the fourth bead vertically." Ask the students to run their fingers across a row on the bead board. Say, "When we are moving across, from side to side, we use the term 'horizontal'." Ask the students to run their finger up and down a row of beads. Say, "When we are moving up or down, we use the term 'vertical'. Find the third bead across horizontally. Count four up from that bead."

e.g.,



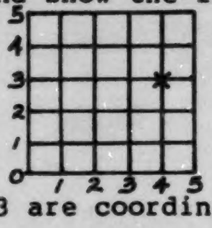
Distribute hundred cards. Say, "We are trying to find number 15 on our Bingo card. We know that number 15 is somewhere in the second row. Let's move across to the second row, then move up to see where the 15 is." Repeat this procedure several times. Say, "When we move across, we say we move in a horizontal manner. When we move up and down, we say we move in a vertical manner."

4.09.08

4.09.08.01 **locate coordinates on a grid**

STRATEGY 1: Prepare and distribute one inch square graph paper. Say, "Kathy and her mother were visiting a friend in a large apartment building but couldn't find the apartment. The doorman told them to walk to Room 4, then to take the elevator to the third floor. Let's use this picture to show where Kathy and her mother went." Ask a student to come up to the chalkboard and show the following.

e.g.,

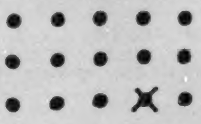


Say, "4 and 3 are coordinates. We name the horizontal 4, and the vertical 3. We always say the horizontal coordinate first, then the vertical coordinate."

Repeat this procedure.

STRATEGY 2: Distribute geoboards to groups of students. Say, "We are searching for hidden treasure on a map that we found in a pirate's chest. The location is 4, 1 for the gold necklace. The bottom left hand corner of the geoboard is zero. Let's move 4 spaces to the right and up 1 space. We call 4 and 1 coordinates. The first coordinate named is the horizontal, the second is the vertical."

e.g.,



Distribute graph paper. Say, "We can get a better picture of the map this way." Ask the students to number 0 through 10 on the bottom of the paper and

STRATEGY 2: cont'd 0 through 10 on the left side. Say, "Let's find the coordinates 4, 1." Place an "x" at that location.

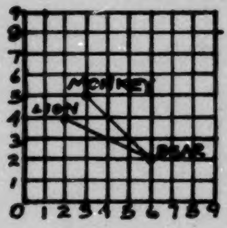
Repeat this procedure using other coordinates.

4.09.08.02 **use line segments to connect points**

STRATEGY 1: Distribute geoboards. Say, "At the park, the ball field was at point 3, 2. 3 and 2 are coordinates. The picnic area was at point 5, 1. Let's take a walk from the ball field to the picnic area." Find point 3, 2, and then point 5, 1. Use a rubber band to connect both points.

Repeat this procedure several times.

STRATEGY 2: Prepare and distribute one inch square graph paper. Say, "At the zoo, the monkey cage is located at point 3, 5, the bear cage is located at point 6, 2, and the lion cage is at point 2, 4. Let's find the path we will take. How can we find point 3, 5? The first number tells us to move across, the second number tells us to move up." Repeat this procedure for coordinates 6 and 2, and for coordinates 2 and 4. Then connect the points. e.g.,



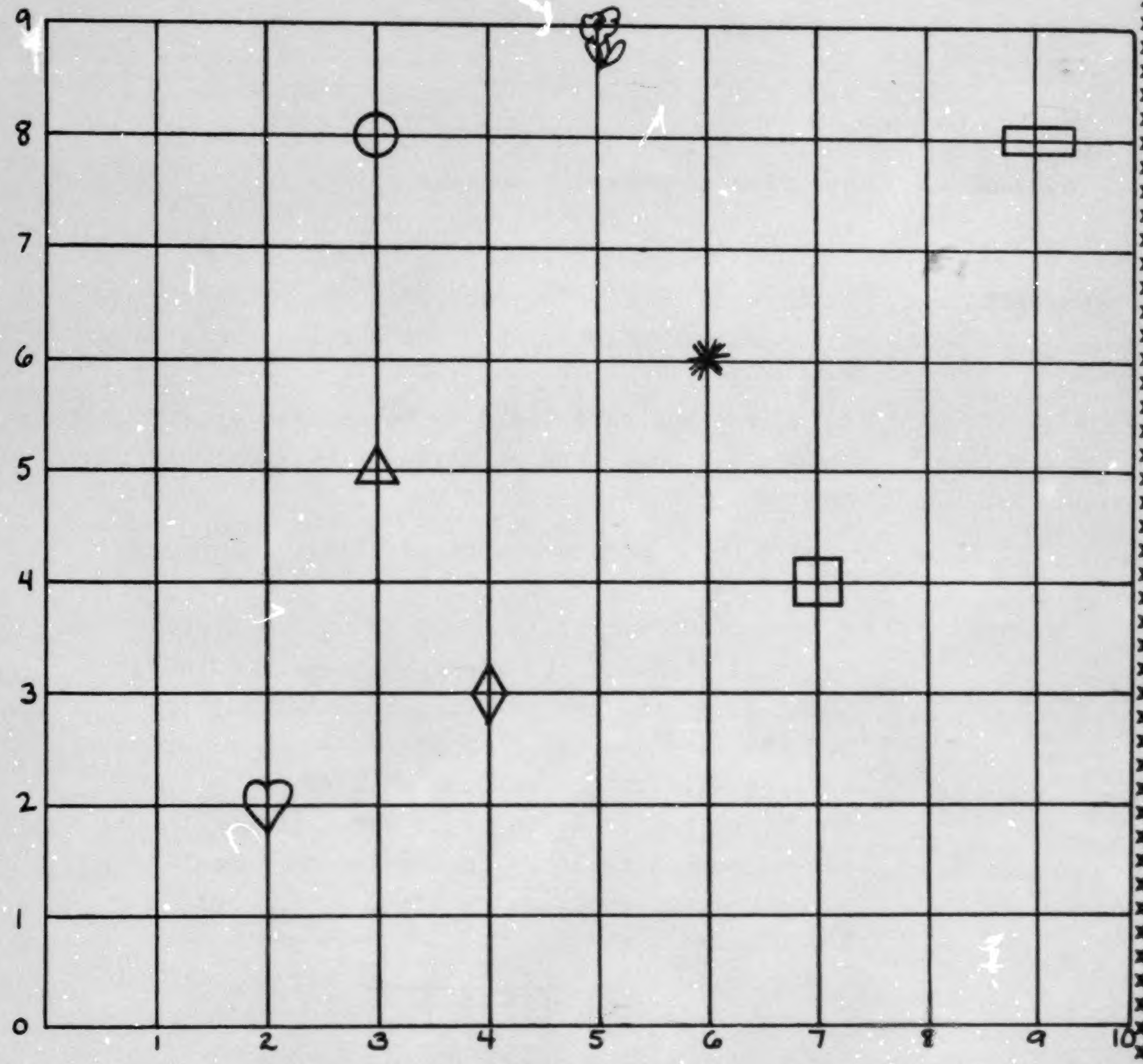
Say, "The path on the graph is a line segment. How many line segments have been completed?" (2)

Repeat this procedure using other coordinates.

P.O. 4.09.08.01

NAME: ______________________ CLASS: ________ DATE: ________

Locate the coordinates.



The ♡ is at (2,2)

The △ is at ________

The ◊ is at ________

The ✿ is at ________

The ○ is at ________

The ✱ is at ________

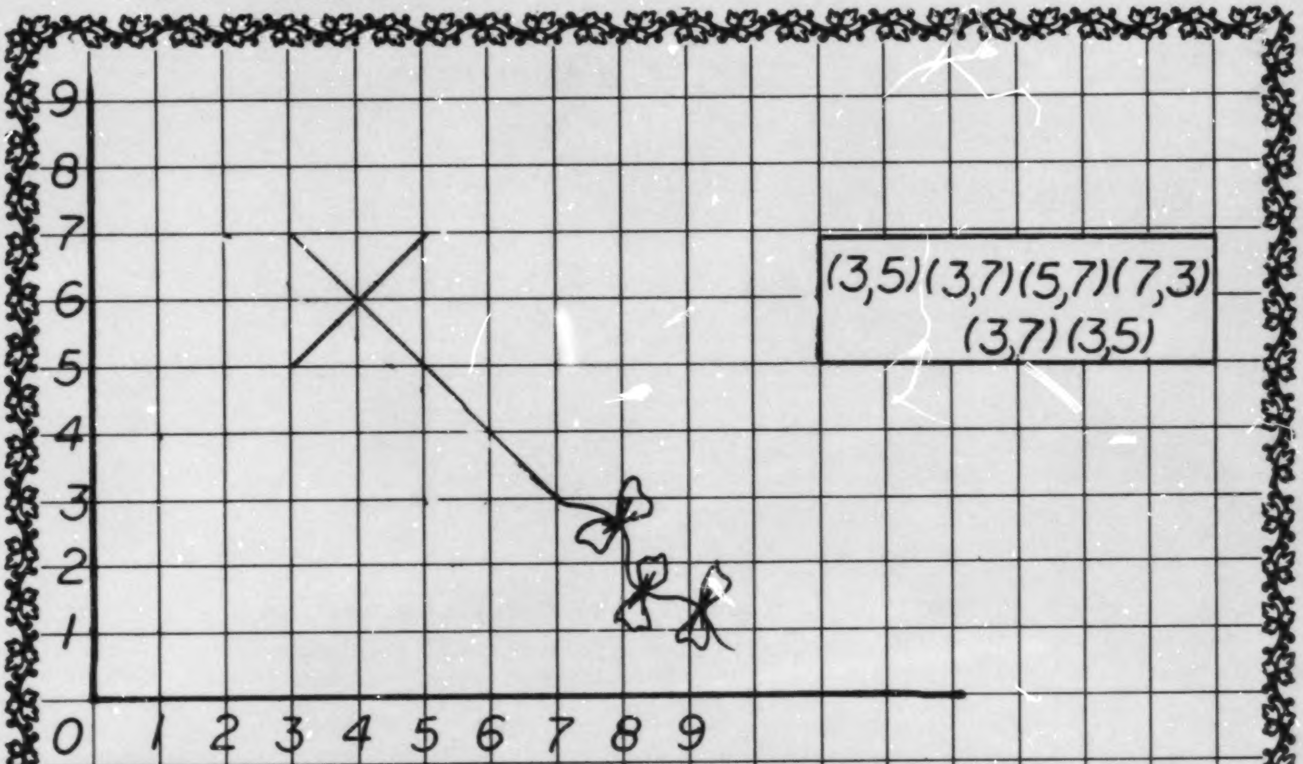
The □ is at ________

The ▭ is at ________

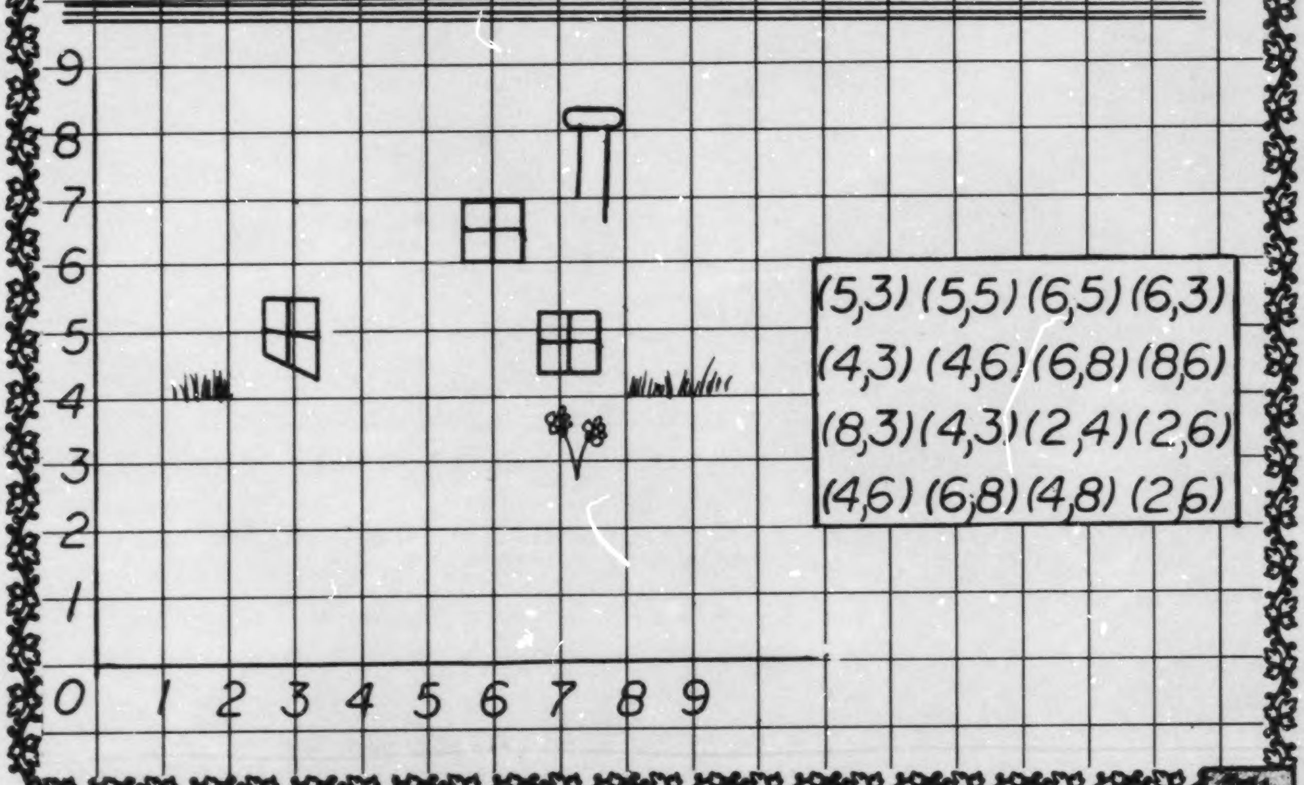
P.O. 4.09.08.02

NAME: ______________________ CLASS: __________ DATE: ________

Locate the coordinators.
Connect the points in order.


9
8
7
6
5
4
3
2
1
0
1
2
3
4
5
6
7
8
9

(3,5) (3,7) (5,7) (7,3)
(3,7) (3,5)


9
8
7
6
5
4
3
2
1
0
1
2
3
4
5
6
7
8
9

(5,3) (5,5) (6,5) (6,3)
(4,3) (4,6) (6,8) (8,6)
(8,3) (4,3) (2,4) (2,6)
(4,6) (6,8) (4,8) (2,6)

631

Unit 68

4.05.06 DIVISION OF 2-, 3- AND 4-DIGIT DIVIDENDS BY MULTIPLES OF 10 AS DIVISORS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.05.06.01B divide a 2-digit number by multiples of 10;

e.g.,

```
                  3 R2
               20) 62
    3 x 20 ---->   60
                    2
```

4.05.06.02B divide 3- and 4-digit numbers by multiples of 10;

e.g.,

```
                   225R6
                30)6756
200 x 30 ---->   -6000
                   756
 20 x 30 ---->    -600
                   156
  5 x 30 ---->    -150
                     6
```

4.05.06.03B solve word problems related to skills learned in this module.

e.g.,
The supply office has 5,200 pencils to give each class. If there are 50 classes in the school, how many pencils will each class get?

```
                   104
                50)5200
100 x 50 --->   -5000
                  200
  0 x 50 --->    -000
                  200
  4 x 50 --->    -200
                    0
```

Each class will get 104 pencils.

4.05.06

VOCABULARY

TERMS

dividend
quotient
divisor

GETTING STARTED

Distribute bead frames. Ask the students to show 40 beads. Say, "How many rows of 10 are in 40?" (4)

Repeat this procedure for 60 beads, 80 beads.

Say, "There are 30 candies in a box. There are 20 boxes. How many candies are there?" Write 30, twenty times, on the chalkboard. Ask the students to add. Say, "For a quicker method to find the answer we multiply." Write 20 x 30 = ☐ on the chalkboard. Say, "How many zeros in 20 and 30?" (2) Place 2 zeros in the product and multiply the two non zero digits.

Repeat this procedure using other examples.

4.05.06

4.05.06.01 **divide a 2-digit number by multiples of 10**

STRATEGY 1: Prepare and distribute squared material. Ask each student to show 40. Ask a student to write 40 on the chalkboard. Say, "How many groups of twenty can we make from 40?" (2) Write the following on the chalkboard.

e.g., $\begin{array}{r} 20 \\ 2\overline{)40} \end{array}$

Place the 2 in the ones place to show two groups of twenty. Say, "We used 20, two times. Multiply 2 x 20 = 40." Write the following on the chalkboard.

e.g., $\begin{array}{rr} & 2 \\ & 20\overline{)40} \\ 2 \times 20 \longrightarrow & \underline{-40} \\ & 00 \end{array}$

Repeat this procedure for other examples.

STRATEGY 2: Prepare four bundles of ten straws and six loose straws. Say, "How many straws do I have? How many groups of twenty straws can I make?" Ask a student to separate the straws into groups of twenty. Say, "How many twenties are there? (2) We used 20 straws, 2 times. How much is 2 X 20?" (40) Write the following on the chalkboard.

e.g., $\begin{array}{rr} & 2 \\ & 20\overline{)46} \\ 2 \times 20 \longrightarrow & \underline{-40} \\ & 6 \end{array}$

Say, "How much is left? (6) Are there any groups of 20 in 6? (No) We have 6 left over. Our quotient is 2 with a remainder of 6."

Repeat this procedure for other examples.

4.05.06

4.05.06.02 **divide 3- and 4-digit numbers by multiples of 10**

STRATEGY 1: Prepare play money. Display four hundreds and eight tens. Ask a student to write $480 on the chalkboard. Say, "This money is to be divided up among 20 schools." Write the following on the chalkboard.

e.g.,

$$20\overline{)480}$$

Say, "Can I give each school a hundred dollar bill? (No) I can exchange the 4 hundreds for 40 tens. Now there are 48 tens. How many groups of 20 can we make from 48 or how many twenties are there in 48? (2) We gave out 2 tens or 20 dollars to 20 schools. How much is 2 x 20?" (400) Write the following on the chalkboard.

e.g.,

$$\begin{array}{rr} & 2 \\ & 20\overline{)480} \\ 20 \times 20 \longrightarrow & -\underline{400} \\ & 80 \end{array}$$

Say, "How much is left? (80) Can we continue to give each school ten dollar bills? (No) We must exchange 8 tens for 80 ones. How many twenties are in 80? (4) How much is 4 x 20?" (80) Write the following on the chalkboard.

e.g.,

$$\begin{array}{rr} & 24 \\ & 20\overline{)480} \\ 20 \times 20 \longrightarrow & -\underline{400} \\ & 80 \\ 4 \times 20 \longrightarrow & -\underline{80} \end{array}$$

Repeat this procedure for other examples with 3-and 4-digit dividends.

4.05.06

4.05.06.03 **solve word problems related to skills learned in this module.**

STRATEGY 1: Write the following on a chart.

> 480 students will go on a trip. If 20 students are on each bus, how many buses will there be?

Ask a student to write the division example on the chalkboard. Say, "The dividend tells the group that is being divided, the divisor tells how they are being divided."

e.g.,

```
      ____
   20)480
```

Ask the students to solve the problem and label their answers.

```
e.g.,         24 buses
           20)480
20 x 20 —-> 400
             80
 4 x 20 —->  80
```

STRATEGY 2: Ask the students to write a 4-digit number to represent the amount of money needed to purchase a car. Say, "I do not have all this money, but I can pay $40 a week. How many times must I pay $40 before I can own this car?" Ask a student to place his "amount" on the chalkboard as the dividend and to use the 40 as the divisor. Ask another student to solve the problem and write out the algorithm.

Repeat this procedure using other problems.

P.O. 4.05.06.01

NAME:______________________________CLASS:__________DATE:________

Find the quotient.

$20\overline{)45}$	$20\overline{)86}$
$30\overline{)60}$	$30\overline{)70}$
$40\overline{)72}$	$50\overline{)79}$
$30\overline{)90}$	$40\overline{)80}$
$20\overline{)31}$	$70\overline{)86}$

P.O. 4.05.06.02

NAME: ______________________ CLASS: __________ DATE: ________

Find the quotient.

30) 7410

20) 421

30) 6713

80) 163

40) 8910

40) 813

20) 9410

50) 191

50) 2413

50) 361

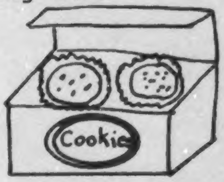
P.O. 4.05.06.03

NAME:______________________________CLASS:________DATE:_______

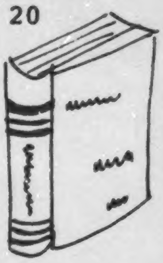
Solve the problems.

a) 480 students are in school. If 20 students sit in each row, how many rows will there be?

b) 660 cookies are in a box. If these are divided among 20 classes, how many cookies will each class receive?



c) There are 2,400 books, in the library. If we place 20 on each shelf, how many shelves do we need?



d) There are 360 straws. If we place 30 in a box, how many boxes will we fill?

e) There are 320 beads. If we place 20 on a necklace, how many necklaces can we make?

4.05.07 DIVISION OF 2-, 3- AND 4-DIGIT DIVIDENDS BY 2-DIGIT DIVISORS

(1-2 lessons)

PERFORMANCE OBJECTIVES

The student will be able to...

4.05.07.01B divide a 2-digit number by a 2-digit divisor and check;

e.g.,

```
                    4          check
               12) 48            12
      4 x 12 ---> 48             x4
                    0            48
```

4.05.07.02A divide 3- and 4-digit numbers by a 2-digit divisor and check;

e.g,.

```
                                  check
                788R6
             11)8674               788
   700x11 ---> 7700                x11
                974                788
    80x11 ---> -880               788
                 94               8668
     8x11 --->   88              +   6
                  6               8674
```

4.05.07.03A solve word problems related to skills learned in this module.

e.g.,

Mrs. Watts has 4,300 straws in a box. If there are 15 containers, how many straws are in each container?

```
                                 check
                 286R10           286
              15)4300            x 15
  200x15 --->   -3000            1430
                 1300            2860
   80x15 --->   -1200            4290
                  100            + 10
    6x15 --->     -90            4300
                   10
```

GETTING STARTED

Distribute five plastic sandwich bags and 30 plastic discs to each student. Ask the students to separate the discs into equal groups of 2, 3, and 5. After the students have used the manipulatives ask them to show their arrangements using division examples.

e.g.,

xxxxx $\begin{array}{r} 6 \\ 5\overline{)30} \end{array}$
xxxxx
xxxxx
xxxxx
xxxxx
xxxxx

Play "Multiplication Bee". Ask the students to stand. Write a multiplication example on the chalkboard using multiples of tens and hundreds, e.g., 100 x 20 = ☐. Ask the first student for the answer. If he/she is correct, he/she remains standing. If the answer is incorrect, the student sits down. Play continues until one player remains standing.

4.05.07

4.05.07.01 **divide a 2-digit number by a 2-digit divisor and check**

STRATEGY 1: Write the following example on the chalkboard.

e.g.,

```
     ___
  32)96
```

Say "How many groups of 32 are there in 96? (3) Multiply 3 by the divisor. Subtract the product from the dividend. There is nothing left over or no remainder. The example is complete. The quotient or answer is 3."

e.g.,

```
                 3
              ____
            32)96
3 x 32 ----> -96
             ---
               0
```

Repeat this procedure using other examples.

STRATEGY 2: Write the following word problem on the chalkboard.

e.g.,

> If we have 86 work tables to be placed in 42 classrooms, how many tables will be placed in each room?

Write $42\overline{)86}$ on the chalkboard. Say, "How many groups of 42 are in 86? (2) Multiply 42 x 2 and subtract the product from 86." Write the following on the chalkboard.

e.g.,

```
                2r2
              ____
            42)86
2 x 42 ----> -84
             ---
               2
```

Say, "Are there any groups of 42 in 2? (No) 2 is the remainder."

Repeat this procedure using other examples.

642

4.05.07

4.05.07.02 **divide 3- and 4-digit numbers by a 2-digit divisor and check**

STRATEGY 1: Write $11\overline{)867}$ on the chalkboard. Say, "I want to distribute 867 books among 11 classes. The books are packed in cartons of one hundred. Each carton has ten stacks of ten books. Loose books (less than ten) are on the shelf. Can I give each class a carton of one hundred books? (No) We must unpack the cartons and make groups of ten. How many groups of ten do I have? (86) How many groups of 11 can I take out of 86 tens?" (7) Write the following on the chalkboard.

e.g.,

```
                    70
                11)867
(11 x 70) ——> -770
                   97
```

Say, "We took out 770 books. We have 97 books left. Can we equally distribute 97 books in groups of ten to 11 groups? (No) We must think of the 9 tens and 7 ones as 97 ones. How many groups of 11 are in 97?" (8) Write the following on the chalkboard.

e.g.

```
                     8
                    70
                11)867
(11 x 70) ——> -770
                    97
(11 x 8) ———>       -88
                      9
```

Say, "How many books are left? (9) Can we equally distribute 9 books to 11 groups? (No) 9 books are left over or remain." Ask the students to add the partial quotients, e.g., 70 + 8 = 78r9. Repeat this procedure for other 3-and 4-digit examples.

STRATEGY 2: Adapt Strategy 1 used in P.O. 4.05.06.02.

4.05.07

4.05.07.03 **solve word problems related to skills learned in this module**

STRATEGY 1: Write the following word problem on the chalkboard.

> Juan has 360 marbles. He wants to divide them equally among 12 boxes. How many marbles will be in each box?

Ask the students which operation will be used to solve the problem. (division) Say, "Once the operation is known, you set up the algorithm and solve. Be sure to label your answer."

e.g.,

```
      30 marbles
   12)360
     -360
        0
```

STRATEGY 2: Write the following problem on a chart.

> 480 students are going on a trip. If there are 12 buses, how many students will go on each bus?

Ask a student to show the division example for the problem on the chalkboard. Say, "The dividend is the group being divided and the divisor tells how the group is being divided." Ask a student to solve the example on the chalkboard.

e.g.,

```
      40 students
   12)480
      480
        0
```

P.O. 4.05.07.01

NAME: ______________________ CLASS: __________ DATE: ________

Find each quotient and check.

Trevor collects
pennies. He puts
25 coins in a book.
How many books will
he need, if he has
75 pennies?

Divide:

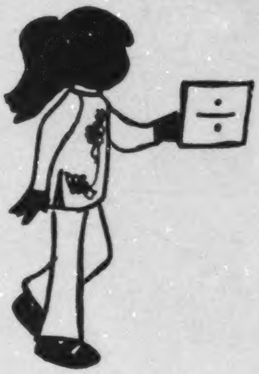
$40\overline{)72}$ $15\overline{)64}$ $18\overline{)91}$

$13\overline{)79}$ $36\overline{)97}$ $12\overline{)86}$

P.O. 4.05.07.02

NAME:____________________ **CLASS:**________ **DATE:**_______

Divide



```
              35r3
        27)948
          -810
30×27      138
5×27      -135
             3
```

Divide

① 57)912

② 29)992

③ 11)1355

④ 12)2781

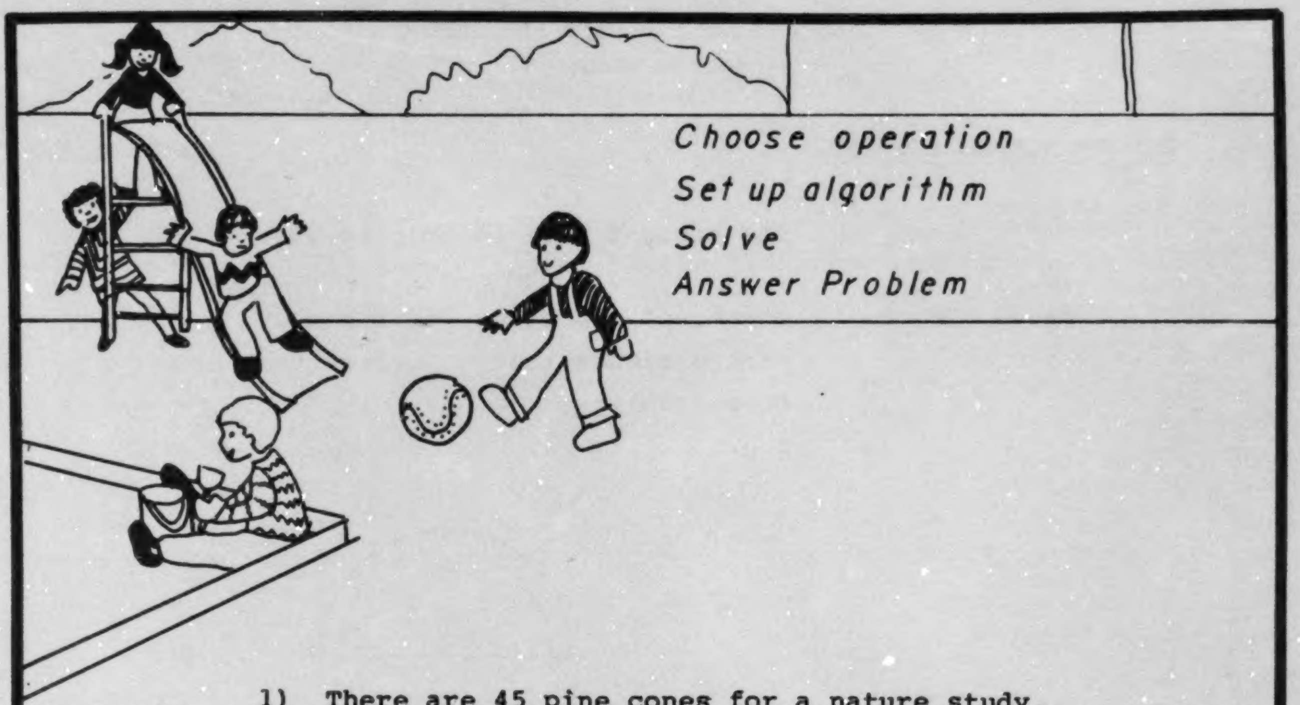
⑤ 79)2815

⑥ 85)5985

P.O. 4.05.07.03

NAME: ______________________ CLASS: __________ DATE: ________

Solve.



Choose operation
Set up algorithm
Solve
Answer Problem

1) There are 45 pine cones for a nature study. They put 7 pine cones in each bag. How many full bags do they have? ____________

2) One box of oatmeal cereal is enough for 7 servings. How many boxes should be bought to feed 23 people. ____________

3) Sonya has 105 walnuts to pass out at a picnic. If there are 15 tables, how many walnuts would go on each table? ____________

4) Louise must pack 255 notebooks in boxes. Each box holds 1 dozen notebooks. How many notebooks will be left over, after as many boxes as possible are filled? ____________

Unit 70

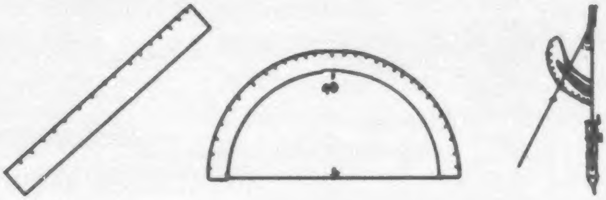
4.09.09 GEOMETRIC DESIGNS

(1 lesson)

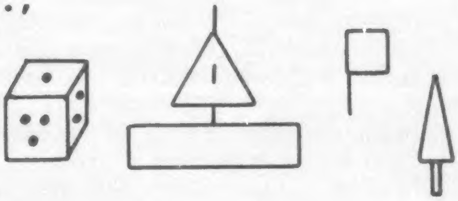
PERFORMANCE OBJECTIVES

The student will be able to...

4.09.09.01B construct geometric figures using straight-edge rulers, protractors and compasses;
e.g.,



4.09.09.02B use geometric figures to make designs and pictures.
e.g.,



4.09.09

VOCABULARY

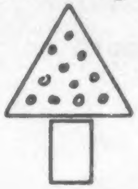
TERMS

circle
polygon
compass
protractor
geometric figures

GETTING STARTED

Distribute geoboards to groups of students. Say, "Construct a line segment. Construct polygons by joining line segments on your geoboard." Ask individual students to come up to the front of the classroom to display their polygons.

Distribute attribute blocks. Say, "We want to make some holiday decorations. Trace these shapes on a paper and make a design." Ask individual students to come up to the front of the classroom to display their designs. Ask the student to identify the shapes they used and describe the properties of the shape.
e.g.,



Say, "This figure has a triangle, a rectangle and circles. A triangle has three sides and three angles. The rectangle has four sides and four angles. The circle is round and continuous."

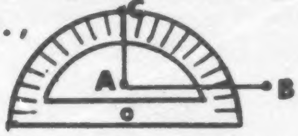
4.09.09

4.09.09.01 **construct geometric figures using straight-edged rulers, protractors and compasses**

STRATEGY 1: Prepare and distribute rulers, construction paper, protractors and compasses. Say, "We are going to construct a triangle. First construct a line segment three inches long. We need two points, one at zero and the other at three inches. Mark both points on your paper and join them." Repeat this procedure for two more segments to construct a triangle. Ask the students to find the sides, angles and vertices of the triangle.

Say, "How many line segments are needed for a rectangle? (4) What is the term we use for the angles in a rectangle? (right angle) We can construct a right angle with a ruler, but it would not be exact. How many degrees are there in a right angle?" (90°) Ask the students to construct a line segment three inches long. Say, "Place the center of the protractor at the first point and find the 90° mark on the curve of the protractor. Mark a point, then join both points."

e.g.,



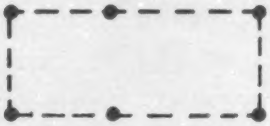
Repeat this procedure until the rectangle is completed.

Say, "There is an instrument that can help us construct a circle. It is called a compass. There is a ruler within the angle of the compass that helps us find the size of the circle we want to construct." Ask the students to adjust the angle of the compass to the size they want their circle to be. Say, "Place the point of the compass firmly on the paper and work your hand around with the pencil."

4.09.09

STRATEGY 2: Prepare dot paper. Say, "We are going to construct a square, a rectangle and a circle for holiday decorations. In order to construct a rectangle, we need four line segments. You need two points to construct a line segment." Ask the students to construct a rectangle by joining the dots four times.

e.g.,



Say, "To construct a square, we need four line segments of equal size. How many angles will the square have? (4) What is the name of the angles of a square?" (right angles or 90° angles) Construct a square using the dots on the dot paper.

Say, "Let's draw these figures on plain paper. We need instruments to help us." Distribute rulers. Ask the students to draw and join four line segments to complete a rectangle.

Say, "Let's draw one line segment to begin a square. How can we construct a right angle?" (use a protractor) Distribute protractors. Ask the students to place the center of the protractor at the first point, find the 90° marking, mark that point and then join both points. Complete the square and the rectangle.

Distribute compasses. Say, "Mark a point on your paper. Place the point of the compass at this point, adjust the compass so that the pencil reaches the paper, and move the compass from that point completely around."

4.09.09.02 **use geometric figures to make designs and pictures**

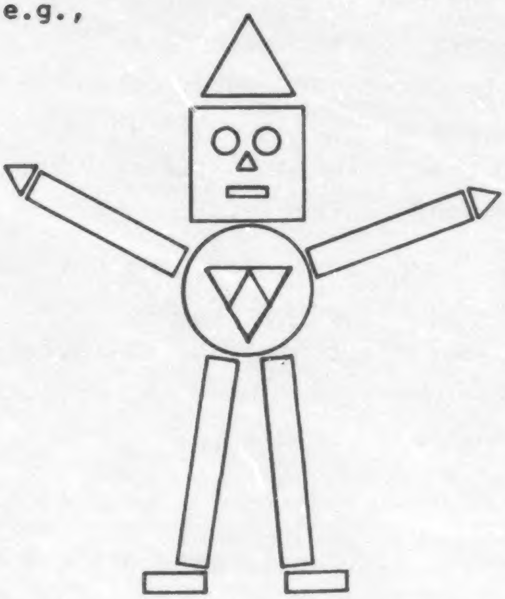
STRATEGY 1: Prepare and distribute graph paper, compasses and protractors. Say, "Jimmy's father is entering a contest for 'The Most Beautiful Garden'. He wants

STRATEGY 1: cont'd

Jimmy to help him make the design. They begin with a circular flower bed of tulips. Place your compass at the center of the paper to construct a circle. They surround the circle with a rectangular bed of marigolds." Ask the students to use a protractor to construct a rectangle around the circle. Say, "They plant a triangle of gardenias inside of the circle." Ask the students to construct a triangle with a ruler. Say, "How many line segments are in the whole garden? (7) I would like you to enter this contest. On a clean sheet of paper, design a garden using as many figures as you like. Name all of the figures you use."

STRATEGY 2:

Say, "We see geometric shapes everywhere. Where are they in this classroom?" (the desk, blackboard, wastepaper basket, light bulb, planter) On the chalkboard, show a design of these. Ask students to make pictures using geometric shapes. e.g.,



347

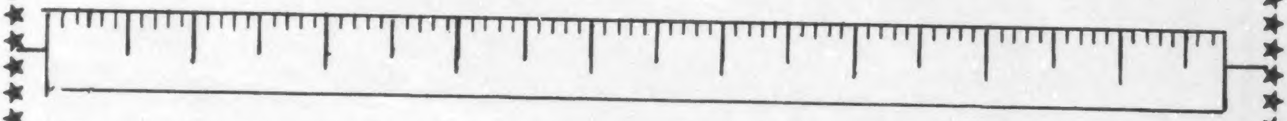
P.O. 4.09.09.01

NAME:________________________________ **CLASS:**__________ **DATE:**________

Construct a triangle with a 2 inch side.
Use your protractor to construct a square. Begin with a 3 inch side.
Use your compass to construct a circle inside the square.

CONSTRUCT
A
SQUARE

CONSTRUCT
A
TRIANGLE



CONSTRUCT
A
CIRCLE

P.O. 4.09.09.02

NAME:______________________________ CLASS:_________ DATE:_______

Use your ruler, protractor and compass to make your own design or picture.